"FAKE PRODUCT IDENTIFICATION USING BLOCKCHAIN"

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ABSTRACT : In recent years, block chain has received increasing attention and numerous applications have emerged from this technology. In our Project uses the decentralized Block chain technology approach to ensure that consumers do not fully rely on the merchants to determine if products are genuine. We describe a decentralized Block chain system with products anti-counterfeiting, in that way manufacturers can use this system to provide genuine products without having to manage direct-operated stores, which can significantly reduce the cost of product quality assurance The manufacturing as well as marketing of counterfeit or duplicate products and goods leads to consequential financial, health and safety threat to end users. It also has adverse effect on the economic growth of original manufacturers and businesses through revenue loss, product defamation, downtime, replacement expenses, forcing many brands to spend money on fighting counterfeits, trust among business partners can also be at risk, stealing sales etc. To overcome and stop these crucial effects of counterfeiting, a blockchain based system is used in identification of original products and also detects duplicate products to ensure the identification of original goods. In this project, with massive emerging trends in wireless technology, QR (Quick Response) codes and barcodes provides a technique to cut down the practice of counterfeiting the products. The fake products are identified using camera scanner, where QR or barcode of the product or goods is linked to a blockchain to store product details and guaranteed unique code of each product stored as blocks in the database. If the code in product matches, the notification will be sent to the customer indicating the authenticity of the product and else if it does not match the code in database, a notification will be sent to customer indicating that product is fake or counterfeited and notification is also sent to manufacturer about the place of purchase if customer accepts the request made by the application. This approach to cut down counterfeit ensures that consumers won't completely rely on merchants to determine if products are original or forged.

INTRODUCTION

The global development of the product or branded product always comes with risk factors such as counterfeiting and duplication of product which in turn can affect the company name, reputation, revenue and customer satisfaction. The trading and marketing of counterfeit products is growing at high rates. It affects adversely on the sales, reputation, and profits of the companies and also do poses a

fatal threat for the unsuspecting buyers. In order to ensure the identification and traceability of fake goods or products throughout the supply chain and to overcome this phenomenon, a fully functional blockchain system is proposed. Companies need to pay very low transaction fees and they don't need to worry about the possibility of delivering counterfeit products to end-users. Because of fake products builder, original manufacturers face the biggest problems and huge losses in sense of brand damage as well as revenue loss. To find the originality of the product a functional blockchain technology can be used. Blockchain is a chained arrangement of recorded information that makes it difficult or impossible to modify or hack the framework. Once the product is stored on the network, hash code is generated for that product and it is possible to maintain all transaction records of the product as well as its current owner as a chain created for that product transactions. It will store all the transaction records as blocks in the blockchain. In the proposed system we are assigning a QR code or barcode generated for a particular product created by manufacturer along with all the details of the product. The end customer can scan that QR code to get all information about that product. After scanning the QR code or barcode on the product, the user can identify whether the product is real or fake.

METHODOLOGY

PROBLEM DEFINITION:

Counterfeiting in manufacturing and marketing poses significant threats to consumers, original manufacturers, and businesses. It leads to financial, health, and safety risks, revenue loss, brand defamation, and undermines trust among partners. Traditional methods of product authentication rely heavily on consumers trusting merchants, leaving them vulnerable to counterfeit products.

To address these challenges, a decentralized blockchain system is proposed to authenticate products and detect counterfeits. Leveraging emerging wireless technologies such as QR codes and barcodes, each product is assigned a unique code linked to the blockchain for storing product details. By scanning the QR or barcode, consumers can verify the authenticity of the product. If the code matches the database, the product is deemed genuine; otherwise, it's flagged as counterfeit. Notifications are sent to both the consumer and the manufacturer, allowing for swift action against counterfeiting. This approach empowers consumers to independently verify product authenticity, reducing reliance on merchants and combating counterfeiting effectively.

PROPOSED SYSTEM:

Based on existing problems we propose the emerging technology is block chain. In our system has enable the communication between the customer and all other departments. Will make for this trusted system we generate the script using smart contract using Ethereum Block chain. Also introduced the Decentralised application for making user friendly GUI for the customer to see their details.

ADVANTAGE:

- Improve the security
- Make a trusted chain for privacy
- Its fully de-centralised application

LITERATURE SURVEY

A faux business middle can affect the improvement of a country. Fake items are fake or unapproved copies of the real object. Fake objects are frequently created with the expectancy to make the most frequent estimation of the imitated item. Quite plenty every agency faces a fake chance when you consider that it is influencing a corporation's earnings in addition to harming the logo's status. Whilst the era gives numerous answers to authenticate the original product, a few technological types of equipment, particularly artificial intelligence help create clones, and blockchain generation creates chaining and tracing. What is required is regular up-gradation and improvement to remain in the front of the forgers. Therefore, we must have guidelines for the market.

This section will present the current literature and state of the art in the area of blockchain. This literature overview have been gathered using both academic search engines such Google Scholar and IEEExplore. The articles have been found on search and indexing terms such as: blockchain, blockchain applications, blockchain survey, blockchain consensus, bitcoin, bitcoin survey, etc. The articles found in these searches have been limited to only include the most cited articles, which for example included articles with more than 70 citations as of December 2018 according to Google Scholar. We have also studied which articles that cite these articles to include chains of citations. Finally, we have divided the articles into categories based on their content and specific blockchain area. These categories are: • Textbooks, Surveys Articles, and General Reports • Articles that Analyze Blockchain Technology • Articles on Blockchain Improvements and Variant • Articles on Different Blockchain Applications • Articles Discussing the Future of Blockchains However, we begin this literature review with the original bitcoin article by Satoshi Nakamoto.

Bitcoin: A peer-to-peer electronic cash system

As previously stated, this article and the usage of blockchains as immutable ledgers can be seen as the origin of the blockchain technologies we see today. It is in this paper the bitcoin and blockchain revolution started. Even though the paper was published as a non peer reviewed white paper, it is one of the most cited works in the blockchain research area. The paper itself is short and does not include so many details. It primarily presents the overall idea and structure. Details on the solution, the specific technologies, and the exact properties on how the bitcoin system would be implemented is not included. Another interesting note, is that Satoshi Nakamoto never mentions the term blockchain specifically in his paper. But he does talk about chains of blocks, proof-of-work chains, and lengths of chains.

Textbooks, Surveys Articles, and General Reports In this section we will study the different textbooks and survey articles related to blockchain. Because of their high point of view and overview perspective

in writing, they tend to be good sources for the direction and understanding of a research area. One of the most well cited textbooks is by Melanie Swan, and below are the most well cited textbooks and surveys that we have found in this pre-study

Blockchain: Blueprint for a new economy

This book gives a good overview of the usage of blockchains and bitcoin as whole. As well as outlines three different versions of blockchain. Blockchain 1.0, 2.0, and 3.0. Where 1.0 can be seen as the currency, such as the original Bitcoin idea by Nakamoto. Where the blockchain is a method for a cryptocurrency, which also incorporates its own generation of the cryptocurrency as payments for the proof-of-work that has been done. Blockchain 2.0 is the next step into contracts. Meaning that it can be used for so much more than just currency in the finance world. It can for example be used in digital contracts, stocks, bonds, loans, smart contracts, smart properties, etc. Finally, the textbook explains blockchain 3.0, which extends the applications beyond the finance domain. Looking specifically into applications of government, health, science, literacy, culture and art. Where the discussions regarding government blockchains are most important for this pre-study. Including, but not limited to decentralized governance services, blockchain passports, blockchain weddings, and voting.

This well cited textbook exists in two editions, where both editions are well cited. The first edition had the subtitle Unlocking digital cryptocurrencies and the second edition had the subtitle Programming the open blockchain, but they have similar contents in general. the second edition mainly includes recent updates that has come to the system which was made after the first edition was published. The book itself is centered around Bitcoin, how it works, and how it is implemented using blockchain technologies. Incldung a deep dive into the Bitcoin refernce implementation that was originally written by Satoshi Nakamoto but has been heavily modified since then. The book also explains in detail how the distributed system works and how the blockchain is managed within it.

SYSTEM DESIGN

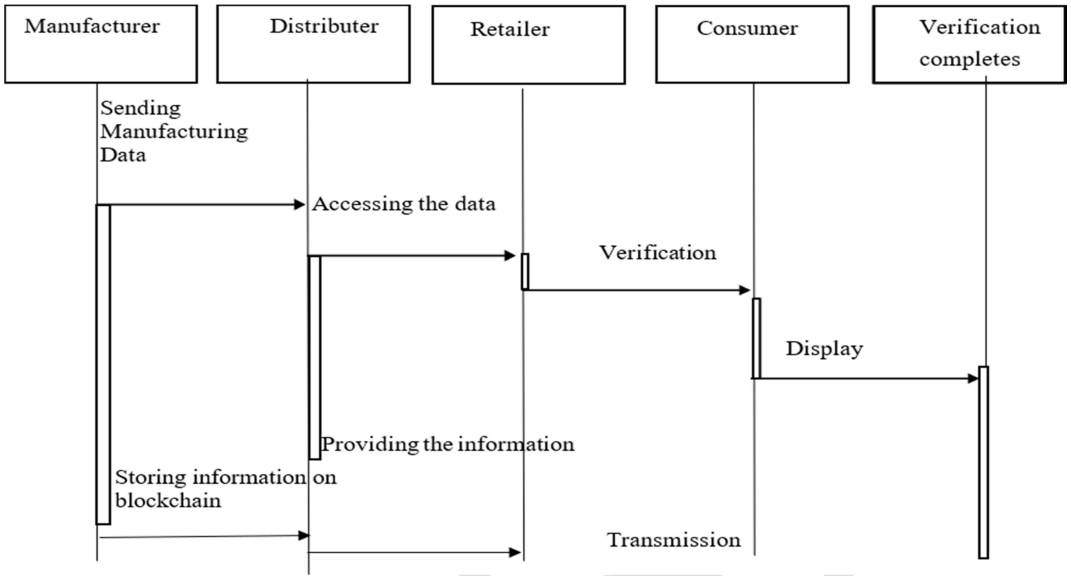
UML DIAGRAMS:

SEQUENCE DIAGRAM:

Sequence Diagrams captures:

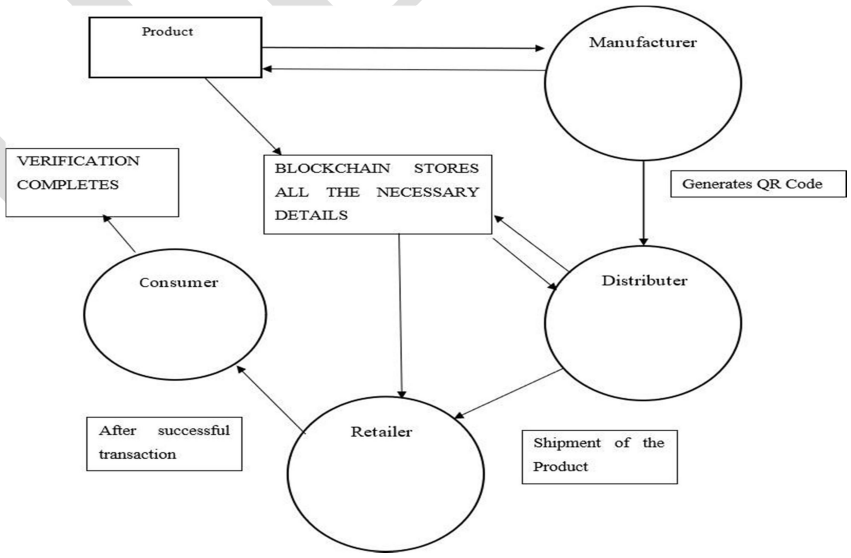
- the interaction that takes place in a collaboration that either realizes a use case or an operation (instance diagrams or generic diagrams)

- high-level interactions between user of the system and the system, between the system and other systems, or between subsystems (sometimes known as system sequence diagrams)



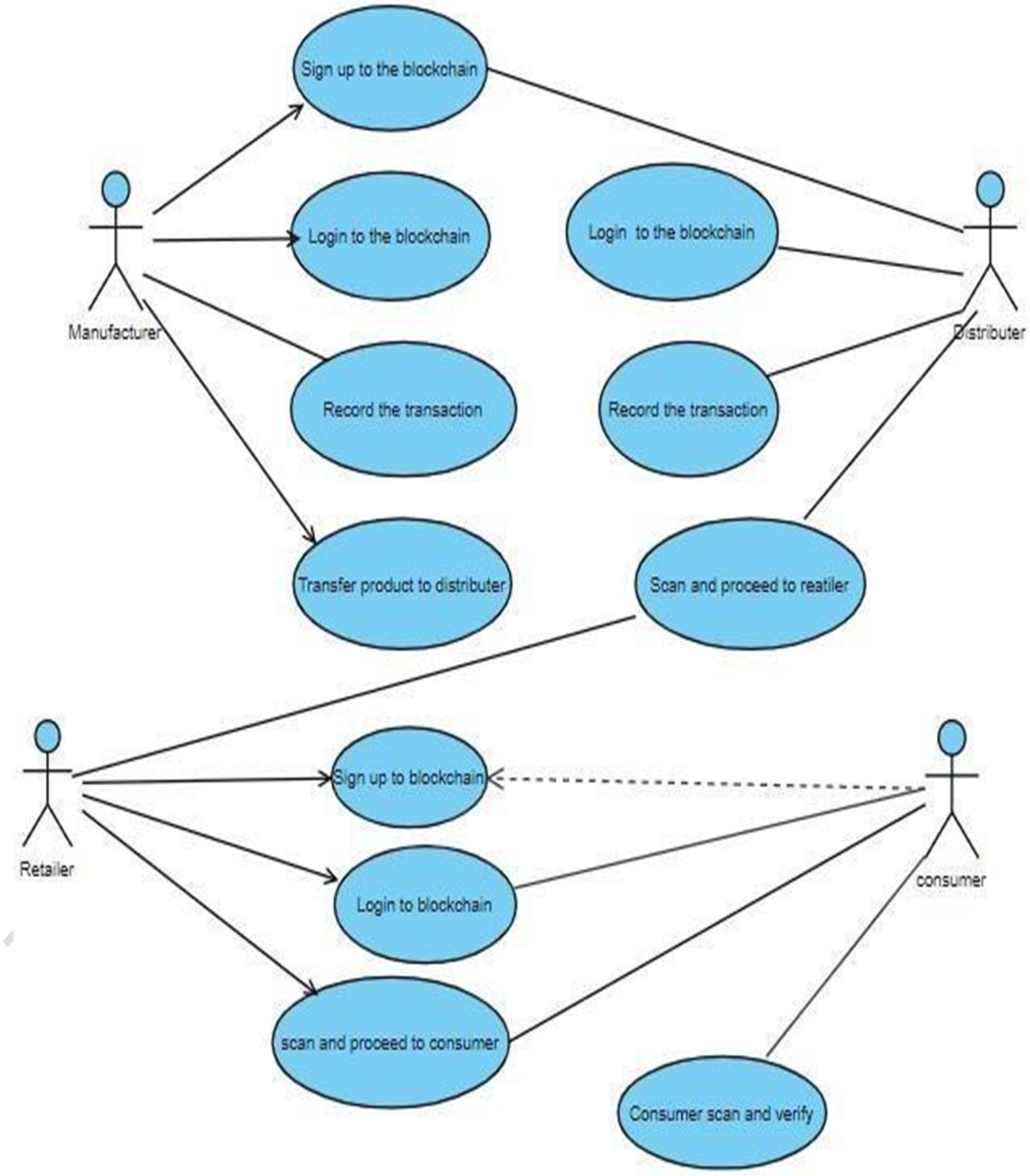
F.g: Sequence Diagram

DATA FLOW DIAGRAM:



F.g: Data Flow Diagram

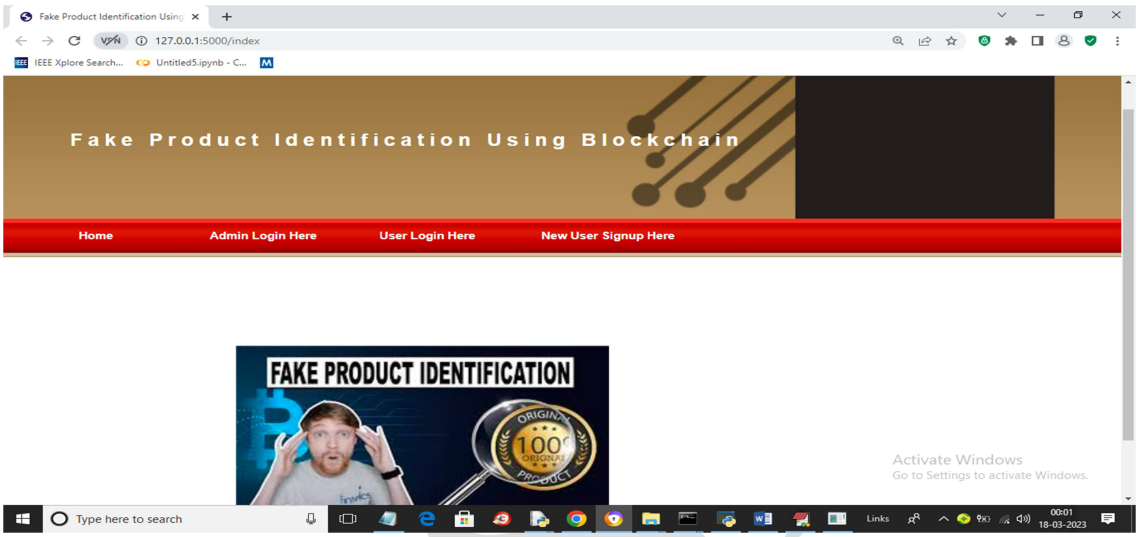
USE CASE DIAGRAM:



F.g: Use Case Diagram

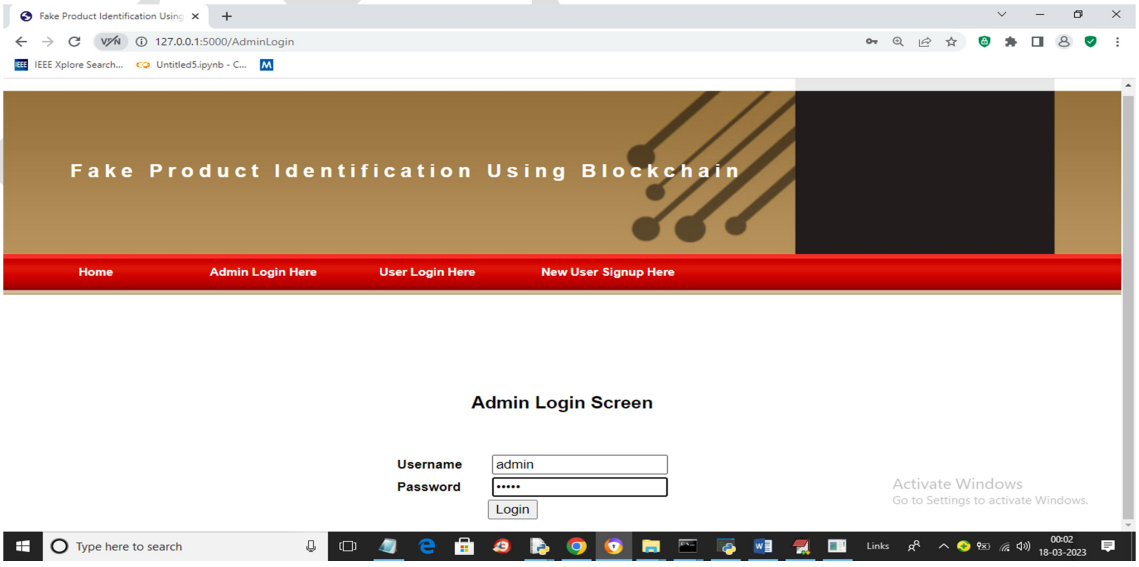
SCREENSHOT

home page

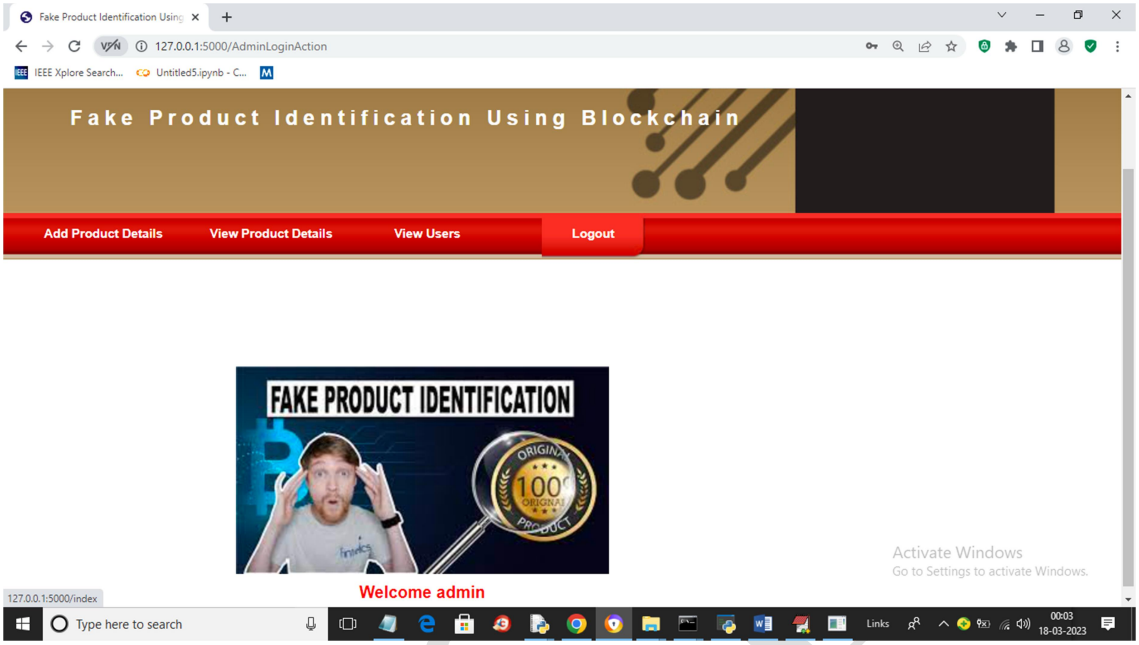


In above screen click on 'Admin Login Here' link to get below login screen

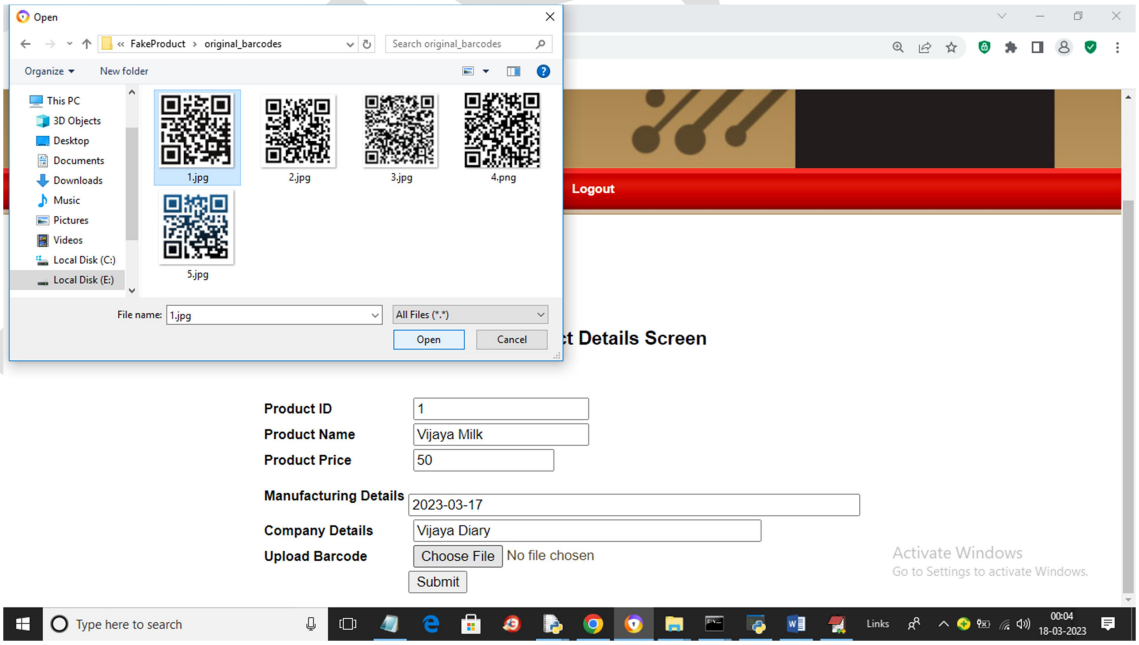
Admin Login Page



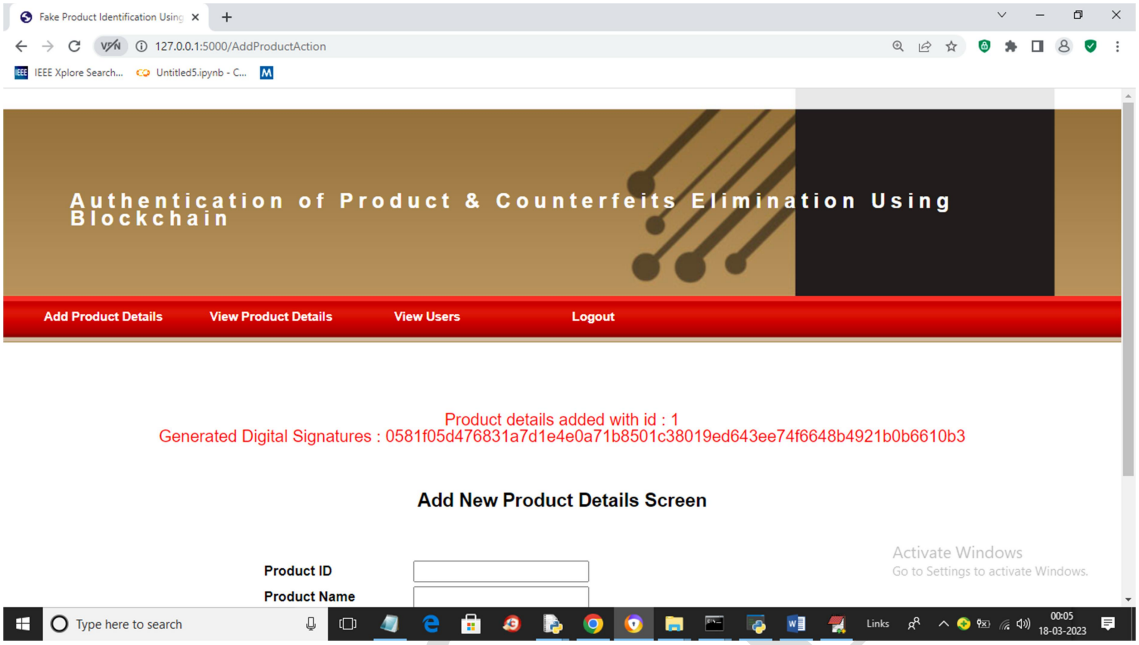
In above screen admin is login using username and password as 'admin and admin' and after login will get below admin Home page



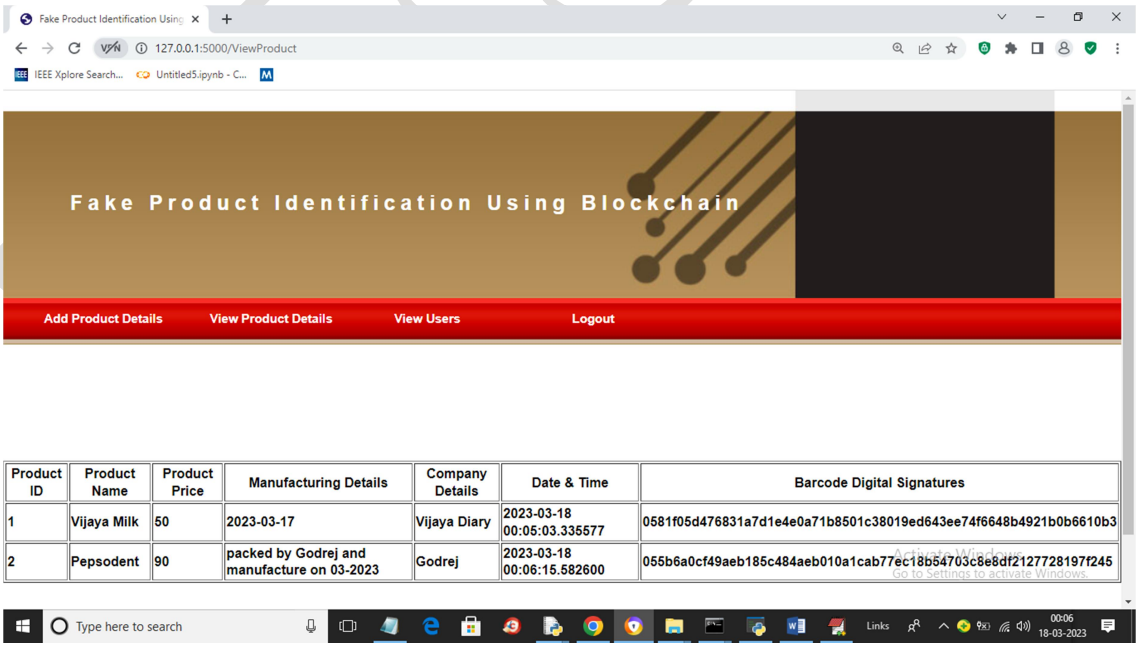
In above screen admin can click on 'Add Product Details' link to add new product details



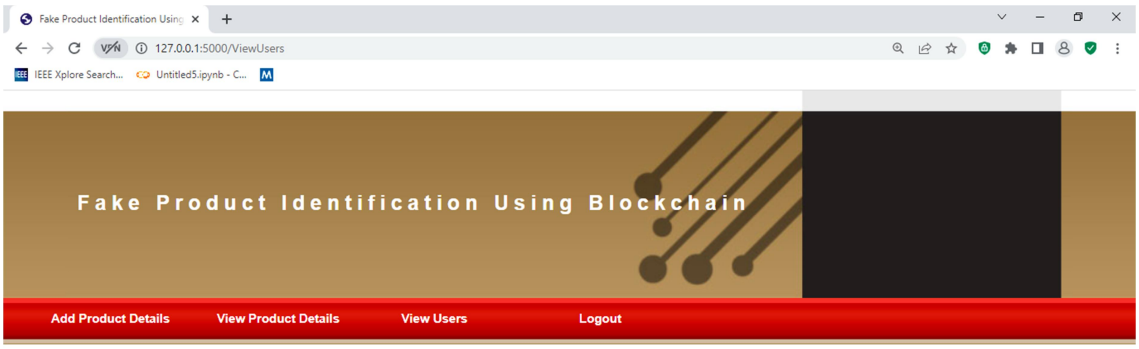
In above screen admin is entering product details and then uploading related Barcode and then press Submit button to extract digital signature from Barcode and then store in Blockchain and then will get below output



In above screen in red colour text we can see product ID and its generated signature stored in Blockchain and now admin can click on 'View Product Details' link to get below output



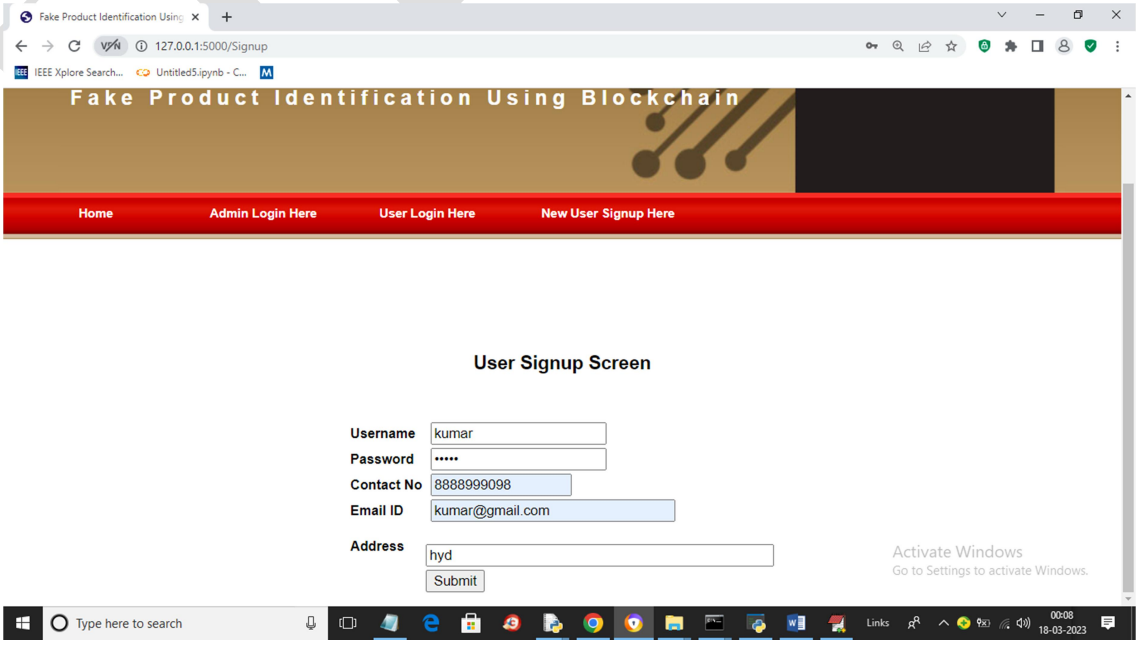
In above screen admin can retrieve product details from Blockchain and then view it and now click on 'View Users' link to get below output



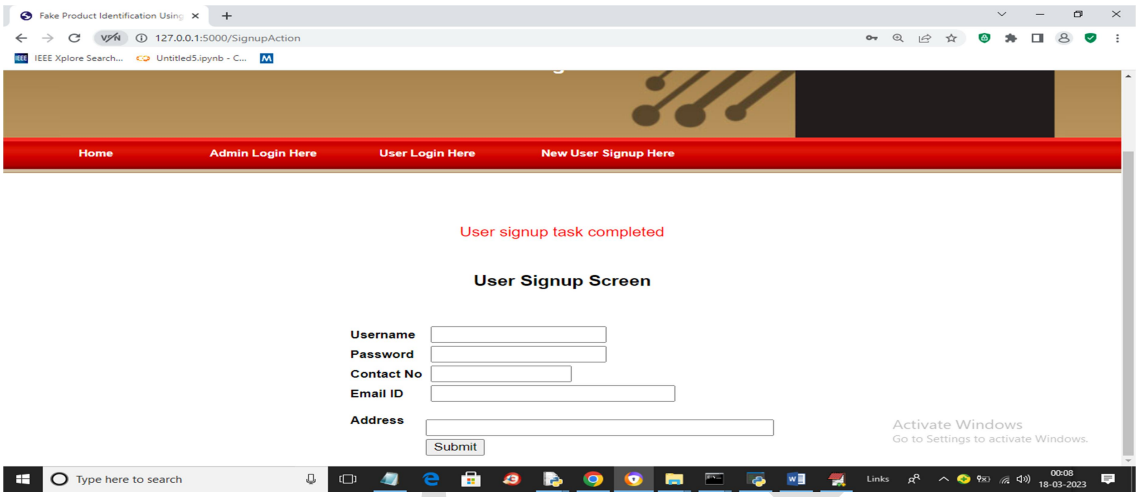
Username	Password	Phone No	Email ID	Address
john	john	7777888987	john@gmail.com	hyd

In above screen admin can retrieve all registered user details from Blockchain and then view it and now logout and then signup and login user

User Sign-Up page

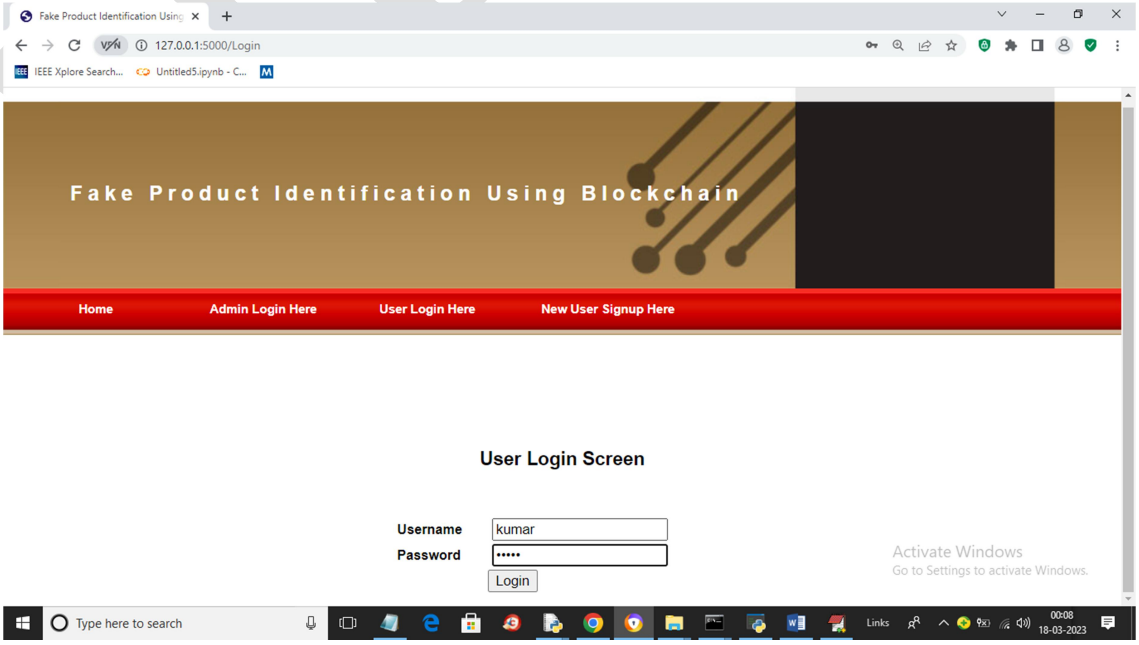


In above screen user is signing up and then press button to store user details in Blockchain and get below output

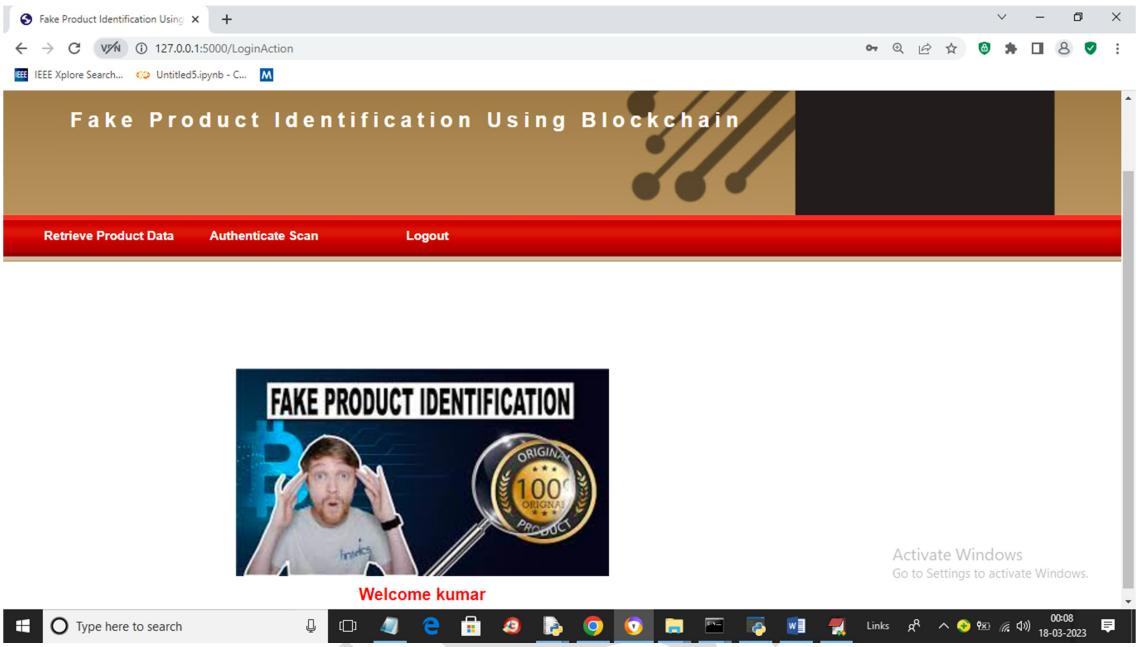


In above screen we can see user signup task completed and now click on 'User Login Here' link to get below screen

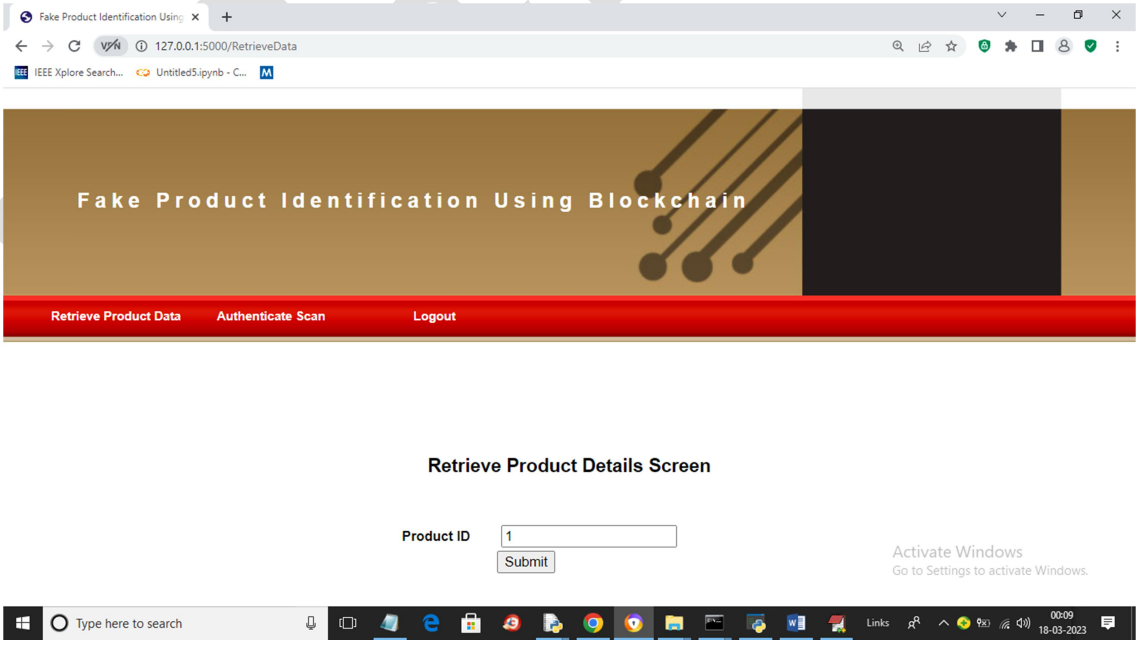
User Login Page



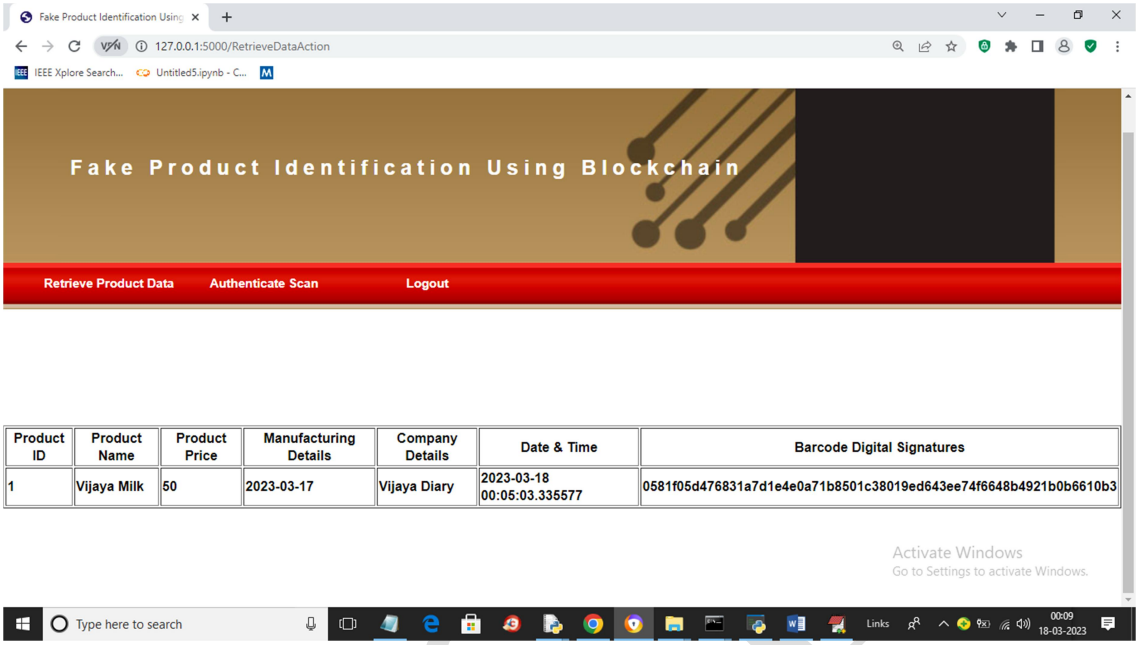
In above screen user is login and after login will get below user home page



In above screen user can click on 'retrieve Product Details' link to search products using Product ID

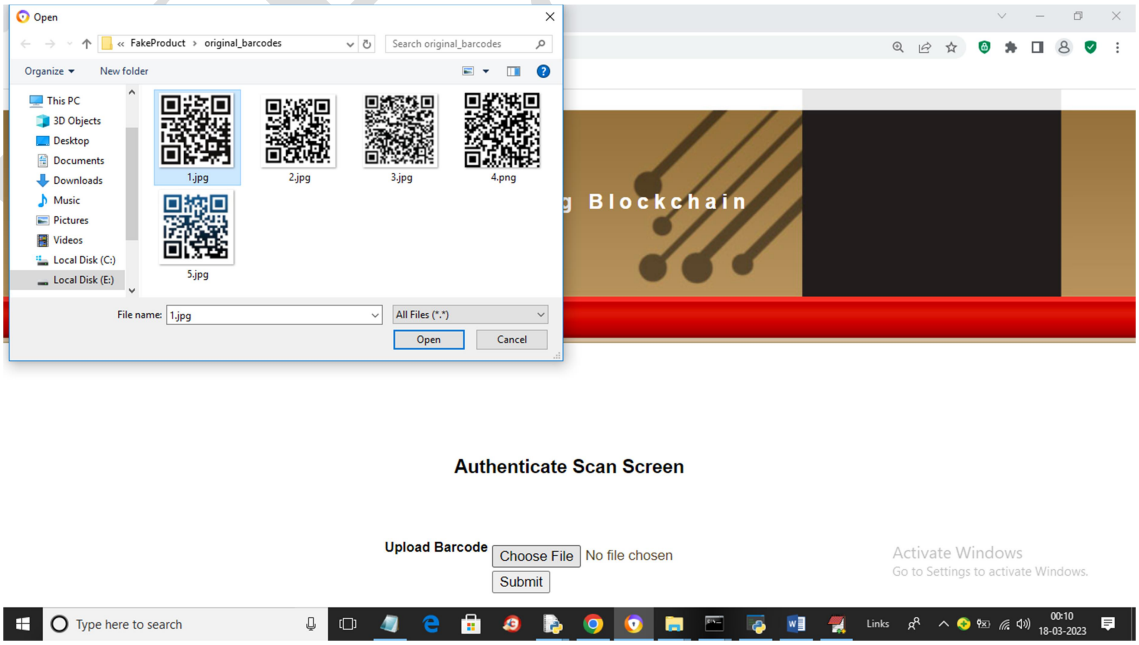


In above screen user entered product ID as 1 and then press button to get below output

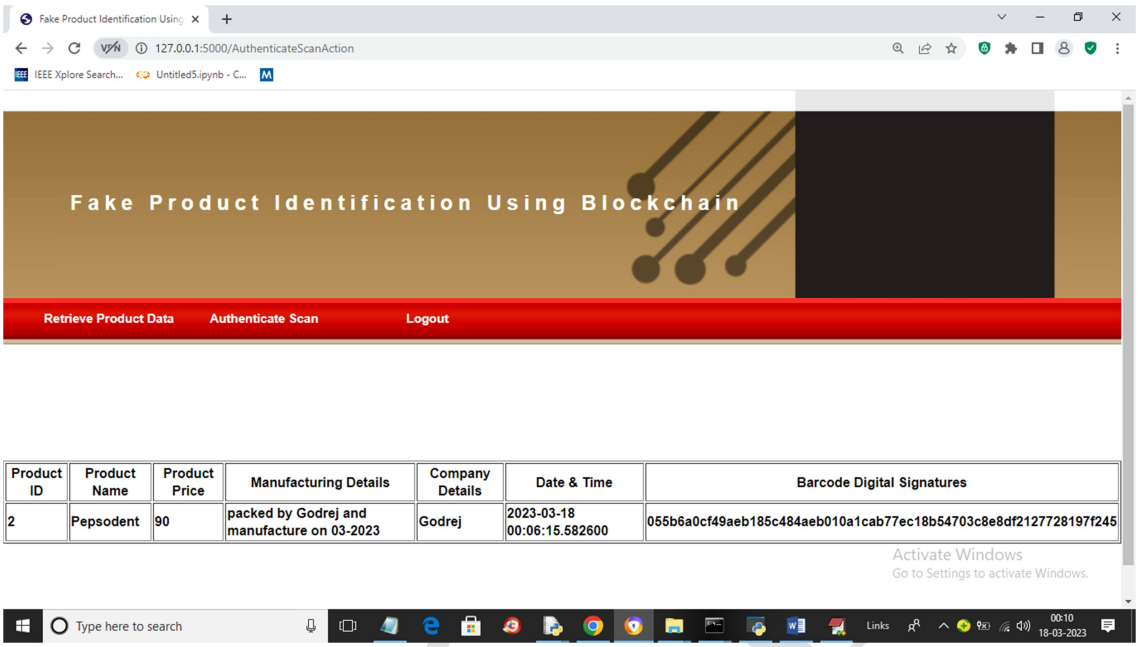


Product ID	Product Name	Product Price	Manufacturing Details	Company Details	Date & Time	Barcode Digital Signatures
1	Vijaya Milk	50	2023-03-17	Vijaya Diary	2023-03-18 00:05:03.335577	0581f05d476831a7d1e4e0a71b8501c38019ed643ee74f6648b4921b0b6610b3

In above screen user can view all product details of Given ID and now click on 'Authenticate Scan' link which allow user to upload Product Barcode 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

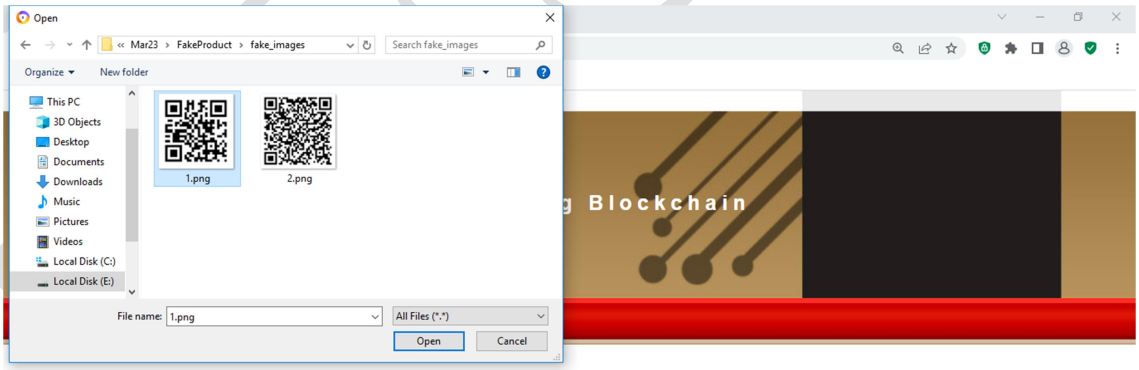


In above screen I am uploading original Barcode and then press button to get below output

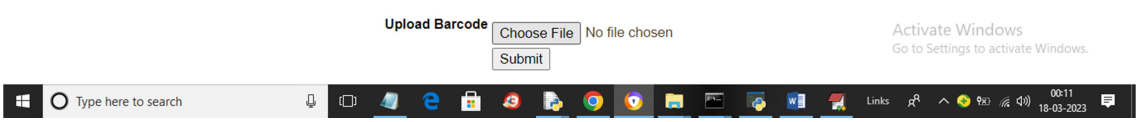


Product ID	Product Name	Product Price	Manufacturing Details	Company Details	Date & Time	Barcode Digital Signatures
2	Pepsodent	90	packed by Godrej and manufacture on 03-2023	Godrej	2023-03-18 00:06:15.582600	055b6a0cf49aeb185c484aeb010a1cab77ec18b54703c8e8df2127728197f245

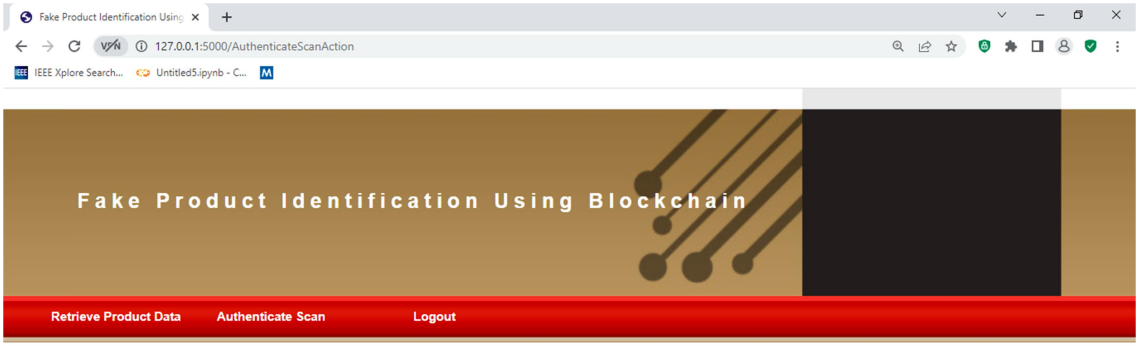
In above screen Barcode authenticated and we got all details from Blockchain and now upload Fake Barcode

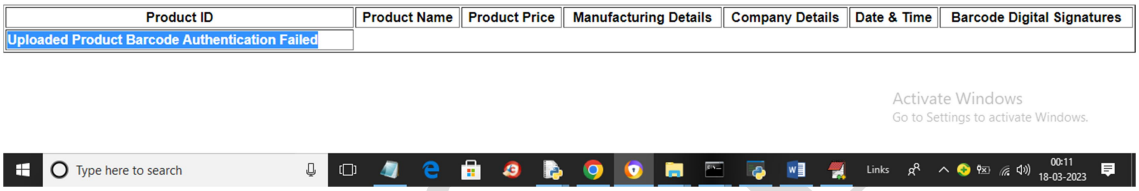


Authenticate Scan Screen



In above screen selecting and uploading Fake barcode and then press button to get below screen





In above screen in blue colour text we can see fake barcode authentication got failed

Similarly you can add any number of product details and perform authentication using Blockchain.

CONCLUSION

With this system, the products journey from manufacturing to customer can be recorded, and the customer is assured that the scans weren't 't faked. Manufacture is able to prove their product is authentic and is also able to track their product 's pathway. The setup is easy to implement and requires less operation cost.

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