EasyChair Preprint

№ 8220

Upgrade the Supply Chain Counterfeit Detection Product Using the Blockchain Management System

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June 10, 2022

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Abstract

Counterfeit items should be increasingly important to the manufacturing and processing industry in recent years. A behavior has an impact on company revenues and profits. Practical blockchain network of avoiding item imitation was required to guarantee the authentication of actual products along the distribution chain. Customers should be needed to rely on trusted third groups for the origin of a specific product that employs a blockchain platform. Software that employs blockchain platform as its foundation makes the information to contain was tamper-proof. A blockchain would be a decentralized and public blockchain that maintains accessible transaction data called blocks in numerous databases defined as chains of various channels. As a result, a block would be implicated could be modified to the preparation of affecting the following blocks. In this study, counterfeit goods were identified with the help of a barcode scanner, which connects the manufacturer's scanner to a BlockChain Based Management (BCBM) system. As a result, the present scheme might be created to gather marketing materials and distinctive codes as database units. It obtains the consumer's special identifier as well as matches its records to the blockchain dataset. If the code resembles, the consumer was notified; alternatively, it obtains information of the customer about they bought the item of designed to check counterfeit goods manufacturers.

Keywords: Blockchain based management; Counterfeit detection; supply chain management; security

1. Introduction

Counterfeiting was among the serious threats to actual product legitimacy. Counterfeit items account for around 8–9% of total trade, resulting in revenue loss. Holograms and scanners were utilized by goods makers to address this problem. The problem of authentic latest products is the

industry's main threat [1]. Quick Response (QR) codes provide a reliable way to tackle the practice of counterfeiting goods, thanks to rising developments in mobile and wireless innovation. QR codes and encoded QR codes were largely utilized for security and privacy purposes, in addition to being widely employed in marketing and information transmission applications. Several web browsers employ QR codes to private login, eliminating the need for the customer to memorize his or her login ID and password. QR codes should be used to verify the decrypted individual user ID at the website [2]. To validate the item, they recommend using QR codes predicated on two-dimensional codes (such as 19 Aztec, Data Matrix, etc). This method decreases the number of QR codes that minimize the amount of encrypting and decrypting.

Goods counterfeit and crime were persistent issues through the value chain and retail spaces, but little has been done to remedy them through the expense utilization auto-identifying systems like barcode scanners, near-field communication (NFC), or radio-frequency identification (RFID) (RFID). Researchers present an RFID anti-counterfeiting and anti-theft method to this work, that could be used to detect counterfeit goods at the point of exchange. The proposed scheme was small and portable, making it ideal to utilize in major retail situations using reduced-price passive tags [3]. They examine a current scheme offered to Tran and Hong to point out the flaws in their plan. A thorough security evaluation of the business method reveals that it meets the comprehensive safety consistency standards and is susceptible to security attacks.

Because of its decentralized, peer-to-peer transmission, dispersed agreement, and confidentiality qualities, blockchain technology should be a popular research area in the last decade. Compliance issues and practical hurdles were overshadowed by blockchain technology. A smart contract was a collection of tamper-resistant, self-verifying, and self-executing programs. Agreements that incorporate blockchain technology were capable of doing tasks in actual time at a minimal price to a higher level of confidence [4-6]. The major elements and operating principles of smart contracts are first explained in this study. Secondly, discover and evaluate the possible smart contract usage scenarios, as well as the benefits of implementing smart contracts in blockchain applications. Finally, the study discusses the difficulties of deploying smart contracts in a future realistic situation [7-9].

2. Related works

The rise of individualized requests necessitates the prompt self-organization of socialized assets of audience knowledge to co-create open architectural products. The desire of manufacturers to monitor the originality and quality of goods has grown as a result of the social manufacturing paradigm. Makerchain would be a novel decentralized blockchain-based platform to manage the cyber-credit of social production among multiple manufacturers. To reflect the unique qualities of personalized items, a molecular signature-based anti-counterfeiting technology was presented. Twinning unique signature information to blockchain and other operational datasets should be realized and expected to increase the trustworthiness of production service contracts between producers. A decentralized production system could be allowed of managing payments among providers, as well as third-party validation to product lifecycle through a record of prior events, and organized implementation method of smart contracts among manufacturers. A Makerchain Decentralized Application (DApp) to show the grouped producers could self-organize around individualized desires using the proposed technique [10].

To tackle counterfeit goods, present anti-counterfeiting supply chains depend on a centralized government. Single-particle computation, memory, and execution were difficulties that emerge as a consequence of this structure. Problems, blockchain technology has identified as a potential answer. In this work, they present the block-supply chain, a new decentralized production chain that utilized blockchain as well as Near Field Communication (NFC) technology to identify counterfeiting assaults. Block-supply chain substitutes centralized supply chains to a recently proposed consensus process that is decentralized and combines performance and safety, unlike previous methods. In comparison to the government's internal Tender mint procedure, the recommended method can achieve remarkable performance while maintaining an acceptable level of safety.

A significant technological breakthrough in current history was blockchain. Blockchain should be a distributed, verifiable currency conversion technology that has revolutionized the way businesses were done. Corporations and software behemoths have begun to spend heavily in the blockchain sector, which should be predicted to be valued at $3 trillion in the next five years. It has grown in popularity as a result of its unquestionable security and capacity to address the effects of digital authenticity. It's a peer-to-peer network's digital record. This article presents an overview of

Blockchain technology, including its history, design, operation, benefits and drawbacks, and applications in diverse businesses.

3. Proposed System

Counterfeit goods were identified using a barcode scanner in this study, of the manufacturer's barcode connected to a BlockChain Based Management (BCBM) framework. As a result, the present scheme might be created to gather product descriptions and distinctive codes as database segments. It obtains the consumer's special code and matches its records in the blockchain databases. If the code verifies, the consumer was notified; alternatively, it obtains information of the customer they purchased the item to detect counterfeit goods manufacturers.

- They have a fast and actual refurbishment, minimal rates and reduced chance of operation, no intermediates, and a great degree of precision.
- The use of blockchain technologies in conjunction with smart contracts offers greater flexibility.
- It is a reduced rate and simple to deploy.

3.1 Modules Description

3.1.1 The producer creates a blockchain and attaches items to it.

The producer could add items, examine as well as create a blockchain to cryptography. Moreover, if consumers send a suggestion, you must approve it.

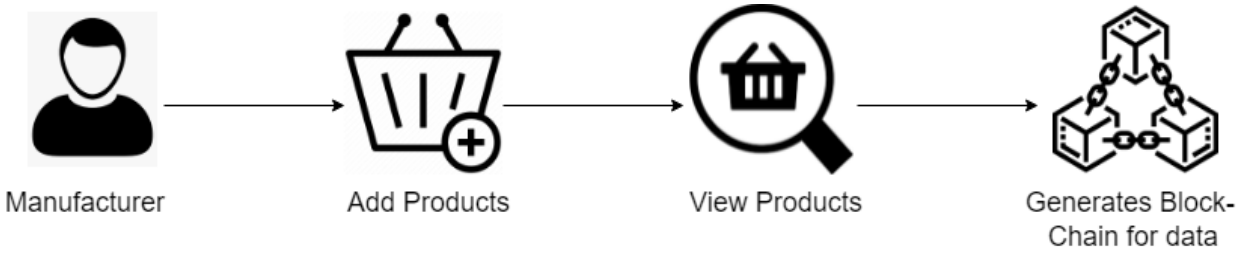

Figure 1: Attached with blockchain

3.1.2 The merchant adds unique goods and presents them to the customer.

Retailers could look at the goods and add to personal, as well as a set of possess prices and present them to buyers.

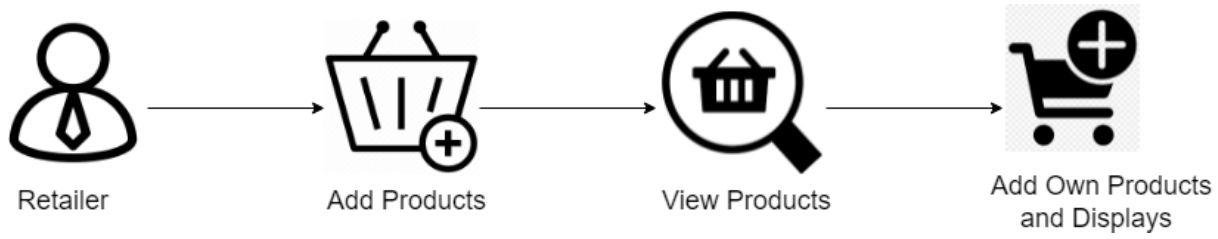

Figure 2: Retailer and customer linkage

3.1.3 Customers examine goods and confirm that they are suitable for purchase.

After creating a profile, the consumer could browse the different products. Add that item to your shopping basket. Before purchasing a product, the consumer should check the pricing and performance of the goods, such as whether it is genuine. As a result, the consumer submits a demand to the producer. The customer's demand would be responded to by the provider.

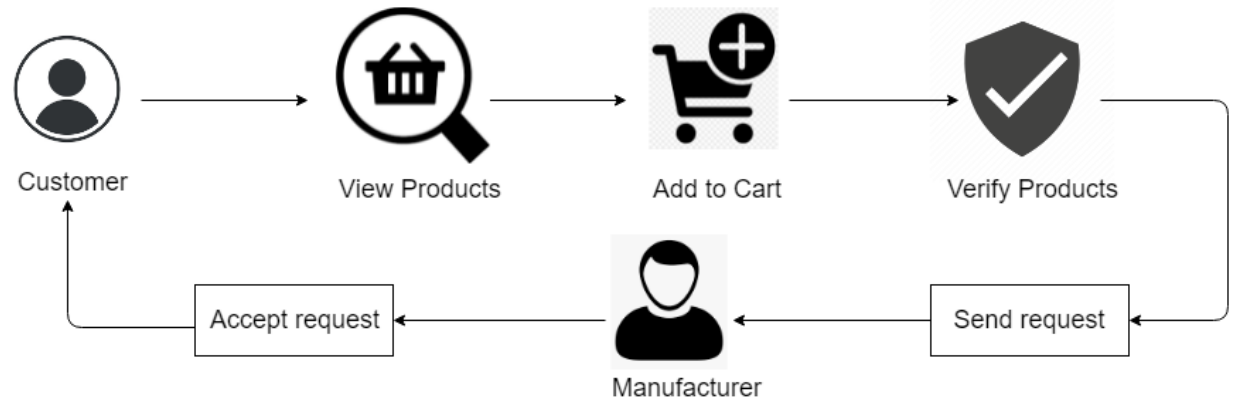

Figure 3: Flow diagram of purchasing

In UML charts, utilization instance charts were a means to represent the system's functionality and objectives. It records a live program's dynamic behavior. A use case scenario was made up of two parts: a use scenario and an operator. Here, the data controller and consumer own membership and password, after that the data owners will upload a text document and encrypted the internet data to asymmetric cryptography.

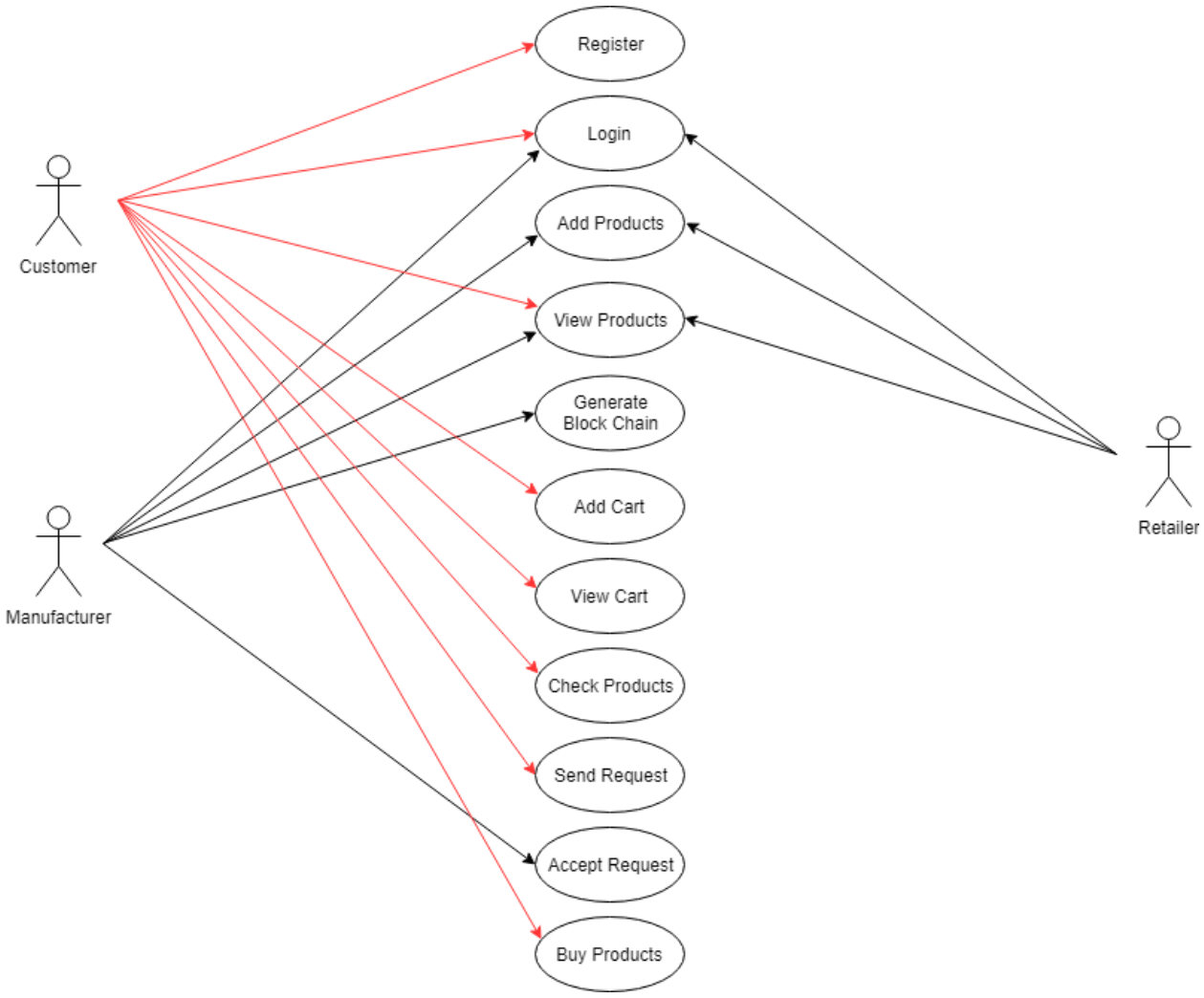

Figure 4: Use case diagram

In the Unified Modeling Language, a stage image, to a state transition graph or sequence chart, depicts the configurations that an element could achieve as well as the transformations between the stages. Then, respect to the start and finish, of the conceivable individual nations are put.

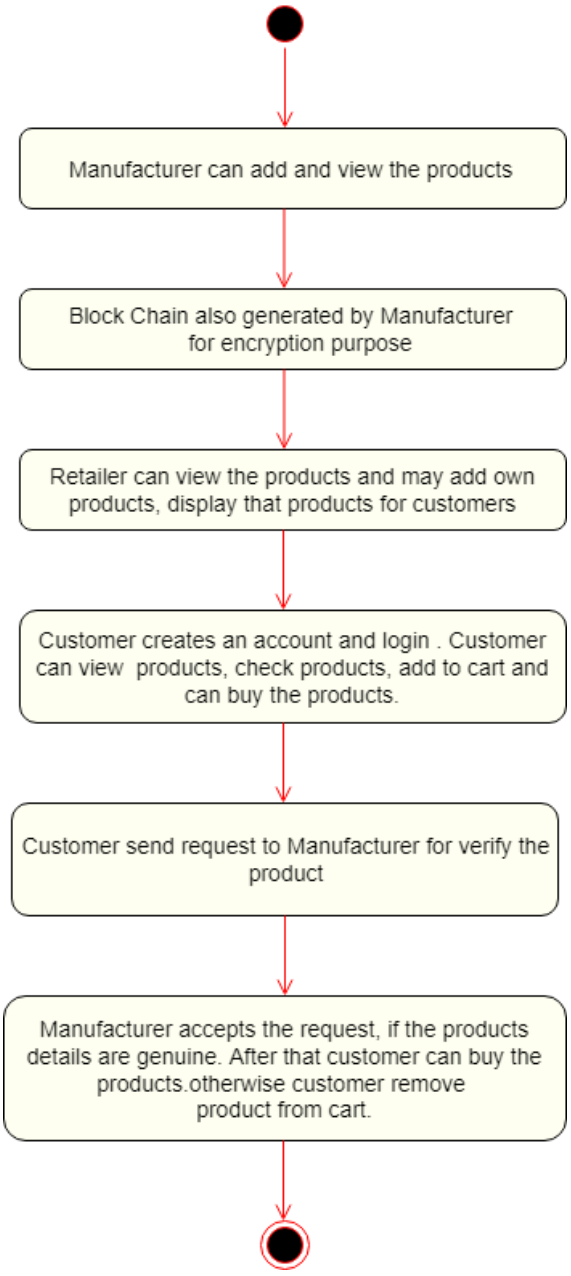

Figure 5: State chart diagram

At multiple levels of analysis, the engagement diagram demonstrates of activities are organized to create a product. Generally, several activities were required to complete an event, especially the procedure was meant to accomplish several diverse projects that involve collaboration.

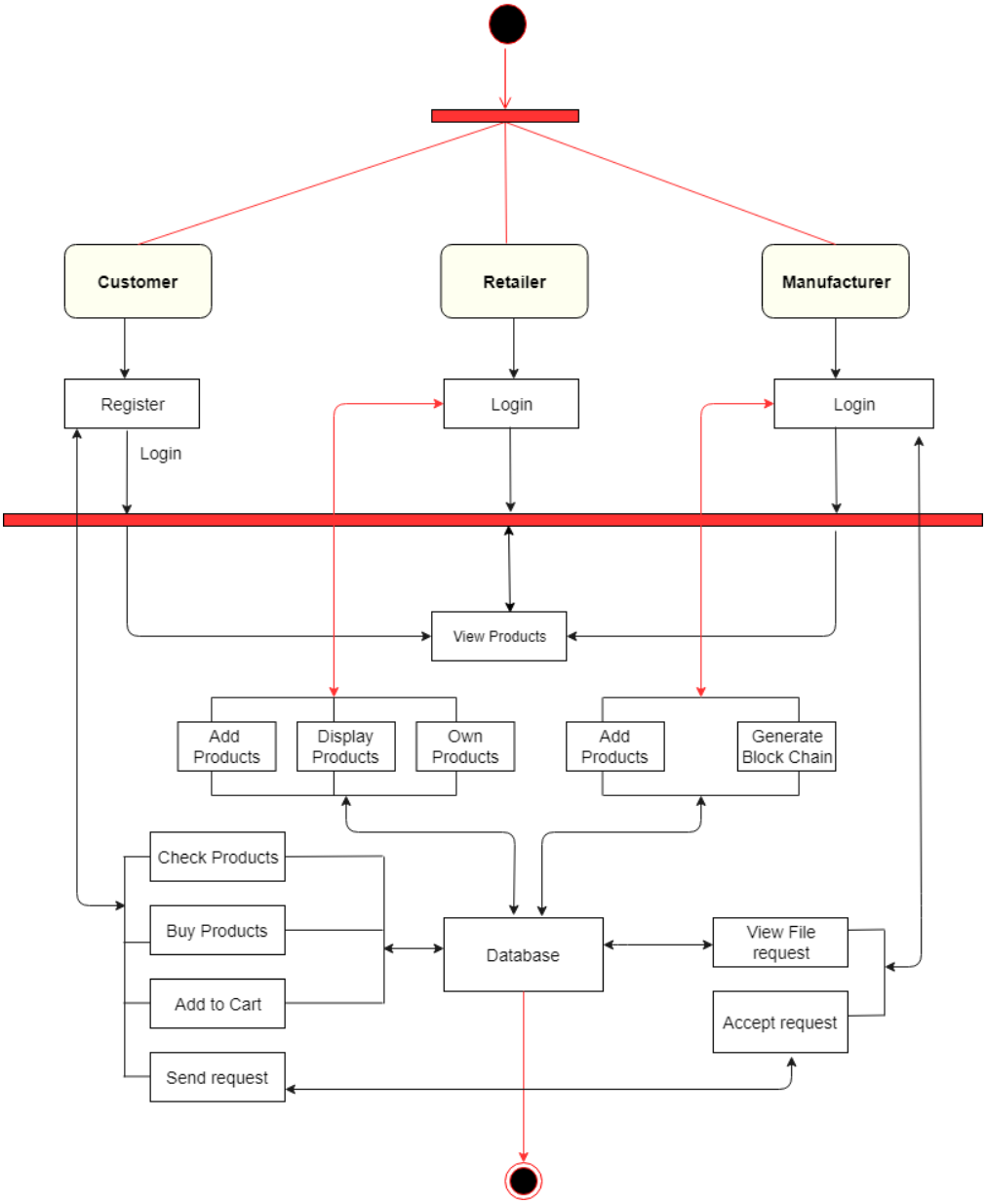

Figure 6: Activity Diagram

4. Results and Discussions

They would use Eclipse to perform the software portion of this project. The programming that would be utilized to construct the metadata component of Cloud Technology is listed below. The suggested strategies were applied to the programming in this case shown in Figures 7 to 12.

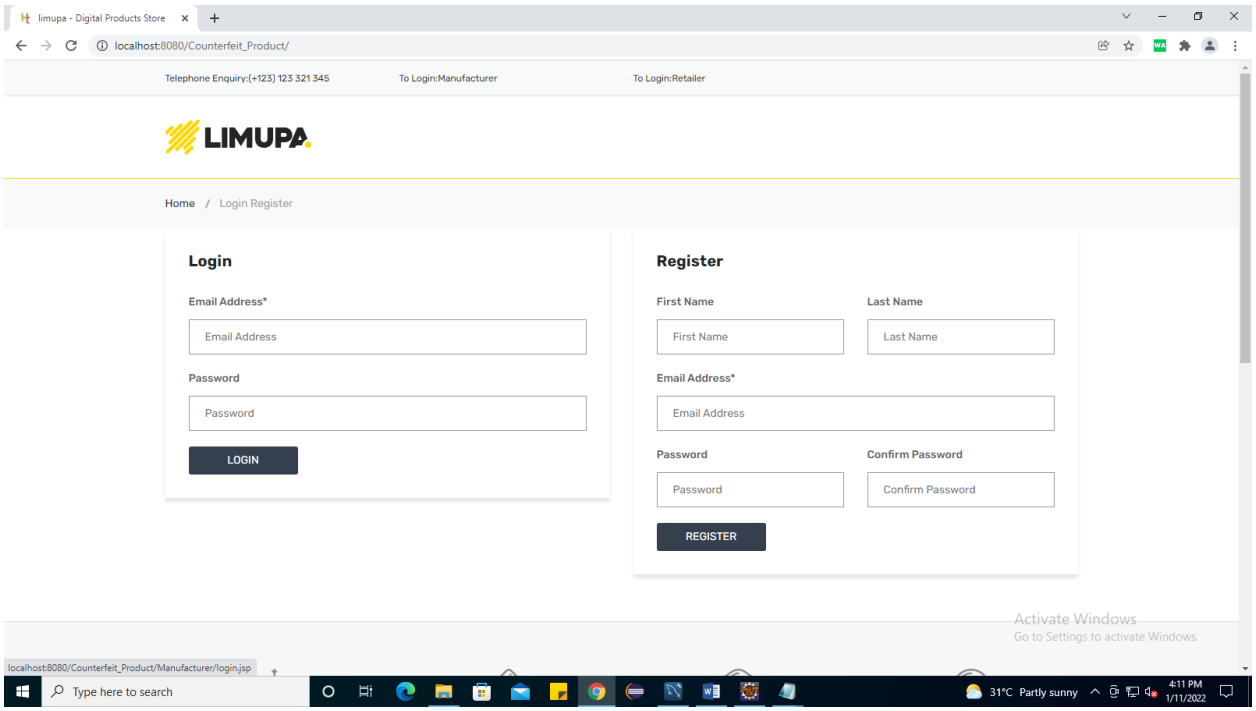

Figure 7: Home page of registration

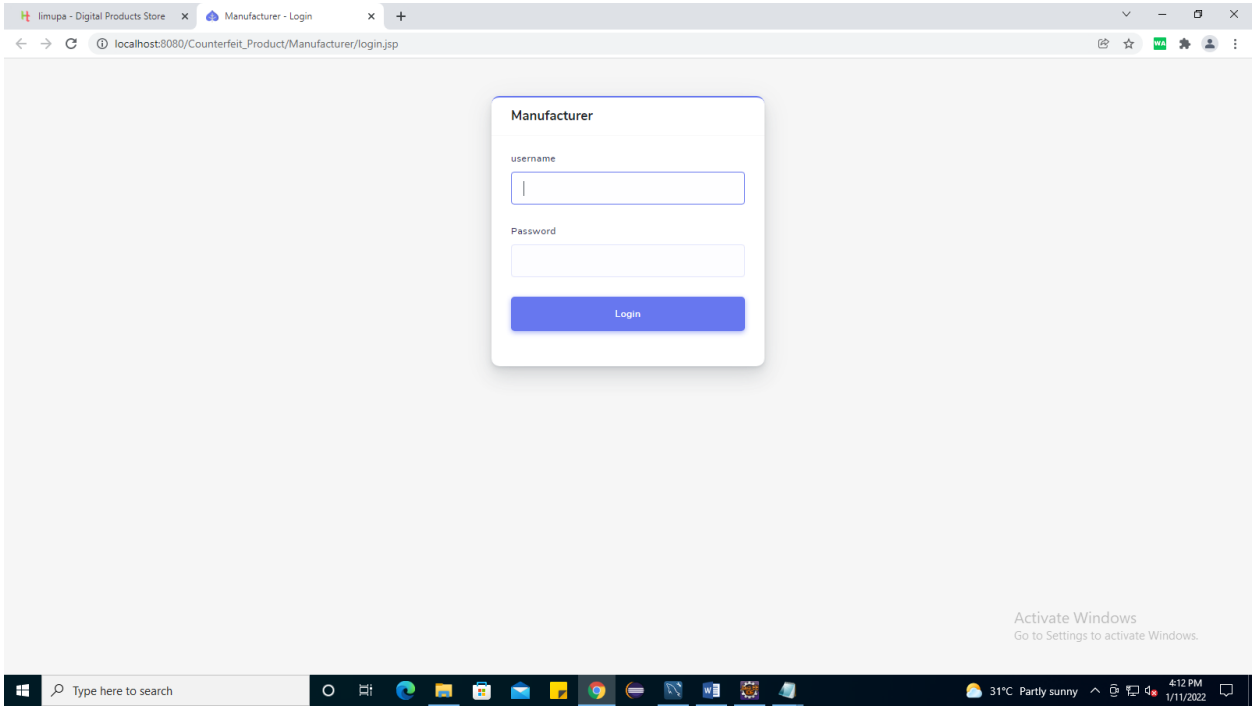

Figure 8: Log in page

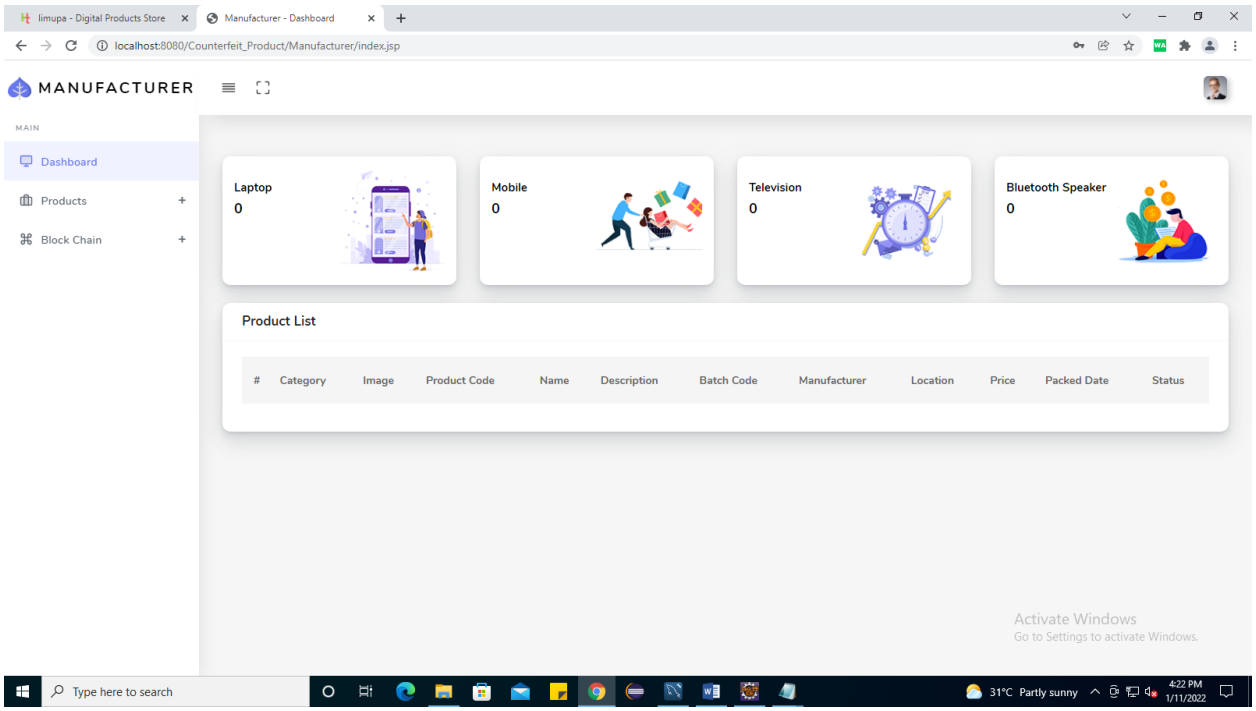

Figure 9: Dashboard

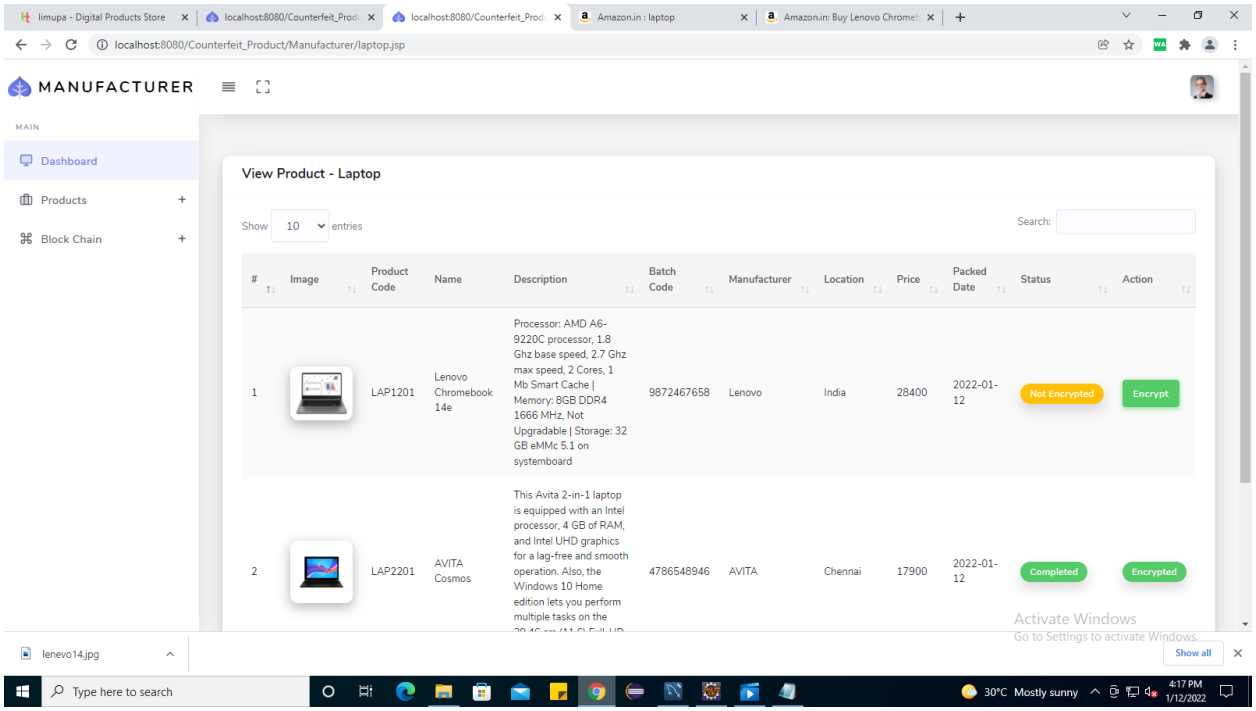

Figure 10: Product information

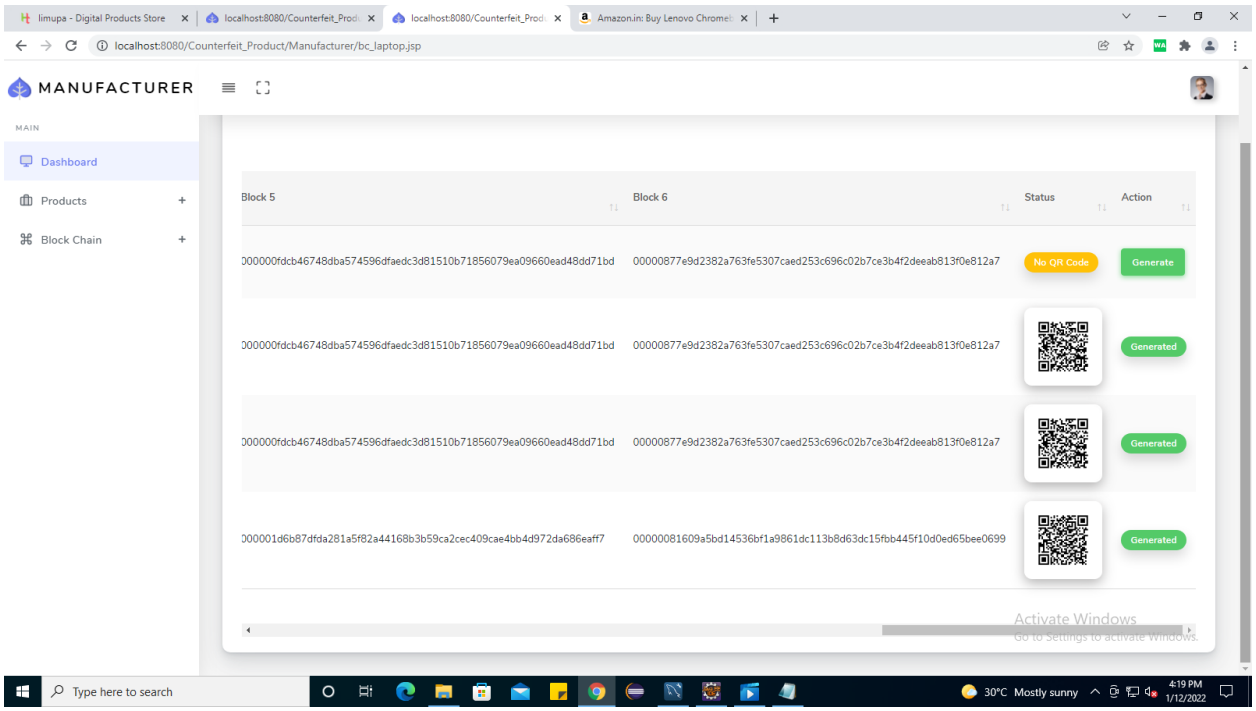

Figure 11: Product details

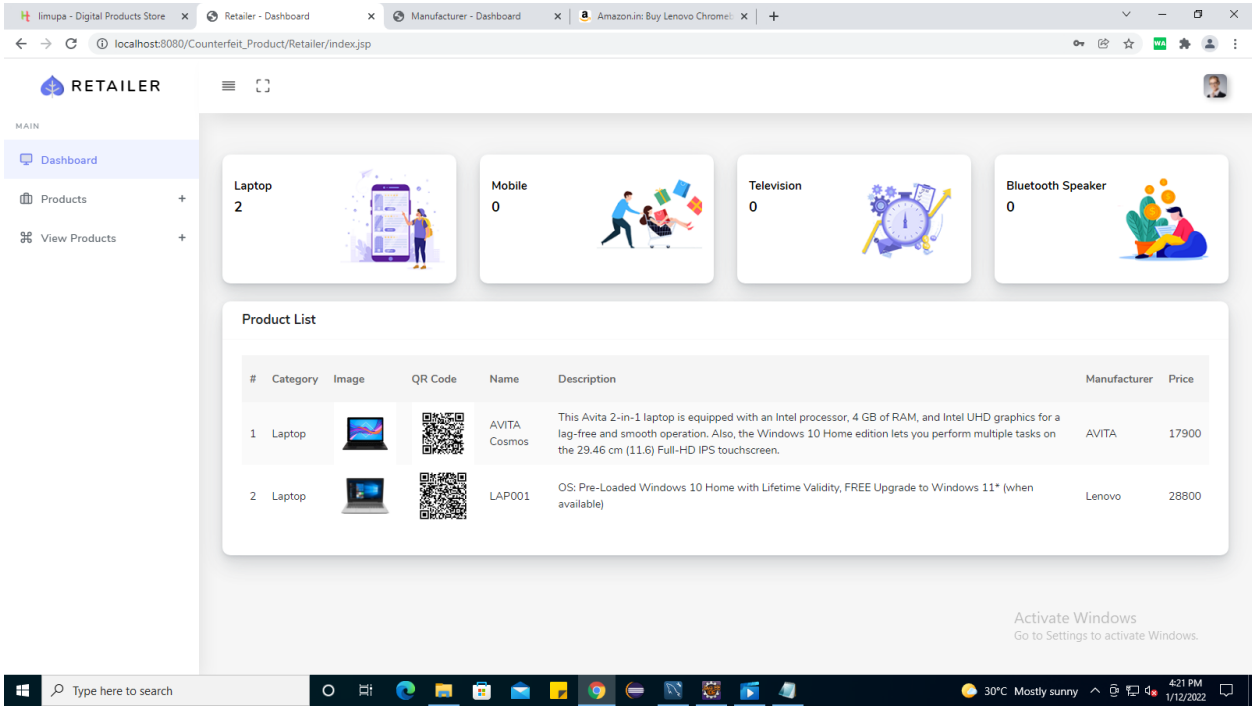

Figure 12: Retailer information

5. Conclusion

Counterfeit goods were rising to the internet and illicit markets these days. The block industry should be a difficult aspect of the distribution chain. Although the administration cannot oversee counterfeit products, it has enacted several legislations and requirements to combat them. As a result, a strategy for identifying counterfeit items and offering safety mechanisms to warn the producer and customer to the distribution chain is required. Organizations could utilize blockchain administration software to record appropriate product market data of a freely available blockchain. The volume of exchanges a merchant could make and the remainders left unsold are visible. The customer could utilize a cryptographic algorithm to do supplier validation. The method of decryption should be to utilize the manager's secret keys. In this study, they present a blockchain framework that allows consumers and businesses to monitor and recognize genuine products with the help of mobile devices. For the end-users and corporate vendors, that should identify counterfeit goods as well as producer legitimacy.

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