

FAKE PRODUCT IDENTIFICATION SYSTEM

DECENTRALIZED SYSTEMS AND APPLICATIONS

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Abstract

Internet has a great place in our lives. Even our daily shopping can be done online. For these reasons, e-commerce sites have become widespread. Upon the spread of these areas, counterfeit products began to be sold on some sites to deceive people. A project has been made to prevent people from buying fake products on such scam sites. In the project, it is aimed that the information of the products can be tracked by keeping them on a blockchain. In this way, the originality of the products will be checked and the sites that sell fake products by deceiving people will decrease and disappear.

1 Introduction

Online shopping has become widespread all over the world. These e-commerce sites, which peaked with the Covid-19 pandemic, are in great demand. From now on, these shopping methods will have a great place in our lives. People can buy lots of things on the internet now. This technology isn't use only for clothes or effects. People can buy anything they want from a E-sommerce website. In China people are using blockchain for supplying food[1].

E-commerce sites that sell fake product for deceiving people increased after online shopping is became so popular. These sites, which reach people especially through social media, sell products that are very close to original ones. People who do not understand the difference between these products become victims of these sites. In order to prevent this, a project idea was proposed to solve this problem.

The production time, place and manufacturer information of the products produced using blockchain technology are stored. Afterwards, the production phase is completed, the distribution and sale phases are also recorded. The information of the owners of the sold product is also regularly recorded on the Blockchain. In this way, the originality of the products will be checked and the people selling fake products will be exposed.

2 Fundamentals

In my project I used Solidity programing language, write smart contracts and used remix.etherum to as IDE. My program is creating products and customers. After that it keeps their information on a blockchain. Every customer can see what they own, information about products, view information about retailers and if something happens to product they can report stolen.

2.1 Blockchain

In the most general terms, blockchain is the distribution of central trust in the internet environment by allowing a central server or a trusted authority to be removed. Blockchain technology is commonly known as the technology underlying virtual currencies such as Bitcoin and Ethereum. The thing people don't know much about is we can write programs and projects on blockchain [2]. People think we can only build some tokens and coins on blockchain but actually every coin or a token is basically a project. For example Ontology blockchain is a high performance, public blockchain. People can build apps on it [3] but people only know the ONT coin.

2.2 Solidity

Solidity is an object-oriented programming language for writing smart contracts. It is used for implementing smart contracts on various blockchain platforms, most notably, Ethereum [4]. It was developed by Christian Reitwiessner, Alex Beregszaszi, and several former Ethereum core contributors to enable writing smart contracts on blockchain platforms such as Ethereum. The programs compiled by the Solidity are intended to be run on Ethereum Virtual Machine. Most of the people are using solidity and Ethereum for writing smart contracts and application but gas price of it is very expensive. Because of that recently there several blockchain project with less prices for transactions.

2.3 Smart Contracts

Smart contracts are computer programs that can carry out transactions and agreements between anonymous parties in a reliable and consistent manner, and no retroactive change is possible[5].

- First time, smart contracts mentioned it in 1994, before Bitcoin.
- Does not need a central authority, legal system or external enforcement mechanism.
- It allows secure deals and contracts.

2.4 Remix.Etherum

Remix is a browser-based IDE that allows us to create and test Ethereum smart contracts with the Solidity language. You can use it online from <https://remix.ethereum.org/> or you can download it offline and use it locally.

3 Implementation

The code basically consists of two parts. The first part was created for the purpose of creating the product, creating customers and updating in case of a change in the product status. These parts are;

- createCode : In this part we gave information about product to create it. These information are,code, brand, model, status, presentation, name of the manufacturer, location and production time. When we gave these information on it system creates and saves a product to the chain.

- **createCustomer** : In this part we gave information to create a new Customer. These information are, name of the customer, phone number that belongs to customer and his/her e-mail address.
- **createRetailer** : In this part we gave information to create a retailer. Name and location of the retailer and its e-mail address.
- **InitialOwner** : In this part we assign a customer to a product. After that, products' new owner becomes the customer.
- **addRetailerToCode** : After product is produced it goes to the retailer. So we assign a retailer to the product.
- **changeOwner** : If one of the customers sell his/her product system changes the owner of the product. So when someone wants to see the details of the product, it shows new customer as owner.
- **reportStolen** : If someone loses their product, he/she gives his/her name and product's code to the system to report as stolen. When someone try to sell the product, it can be tracked.

The second part is exist to see the customer, product or retailer details. This part is used for showing information about them. There are 5 different areas for these call methods.

- **getCodes** : In this part when we give customer's name, system shows that all the products of he/she owns.
- **getCustomerDetails**: In this part when we give code of the products, system gives information about the customer who owns it.
- **getNotOwnedCodeDetails** : This function is exist for showing product details if the person scanning the product is not the owner.
- **getOwnedCodeDetails** : This function is exist for showing product details if the person scanning the product is the owner.
- **getRetailerDetail** : This functions shows the retailer of the product.

Fake Product Identification System is all about these codes. With the help of the system we can observe every detail about products and we can be sure if it is original or not.

4 Results and Conclusion

There are many e-commerce sites on the Internet to deceive people. These sites deceive and defraud people by showing fake products as original. Thanks to our project, we want to eliminate this situation. We have designed a system that we can follow every step of the way from production. In this way, when you shop online, you will be able to verify the originality of the product with this program. I run the program and created necessary parameters and showed the outputs that can be seen by customers.

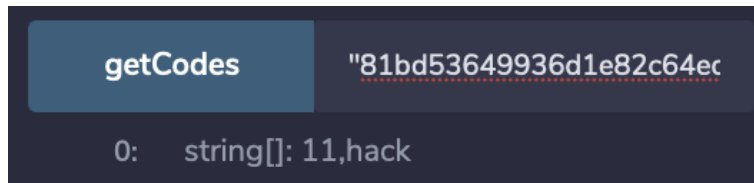


Figure 1: Shows the products which is owned by a Customer

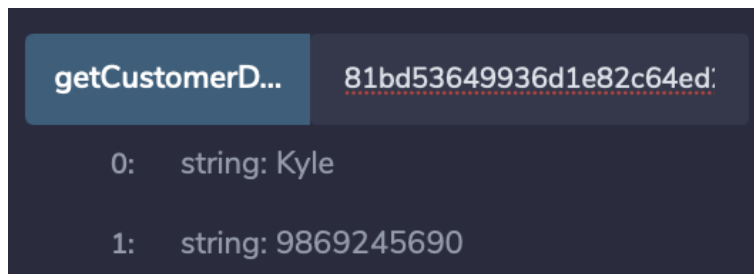


Figure 2: Shows the Customer Information



Figure 3: Getting Information about Product

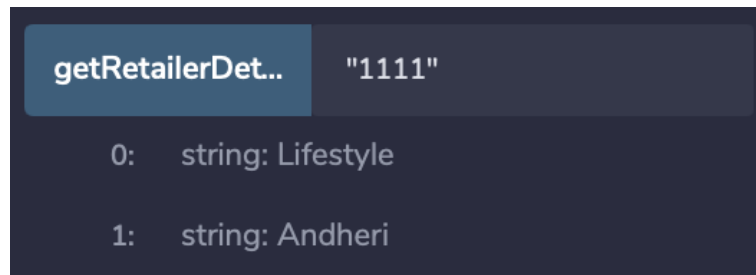


Figure 4: Shows the Retailer Details

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