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BLOCK CHAIN SOLUTION FOR PRODUCT VERIFICATION AND COUNTERFEIT PREVENTION

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ABSTRACT:

Block chain technologies have gained interest over the last years. While the most explored use case is financial transactions, it has the capability to agitate other markets. Block chain remove the need for trusted intermediaries, can facilitate faster transactions and add more transparency. This paper explores the possibility to deflate counterfeit using block chain technology. This paper provides an overview of different solutions in the anti-counterfeit area, different blockchain technologies and what characteristics make blockchain especially interesting for the use case. We have developed three different concepts and the expansion of an existing system concept, is pursued further. It is shown, that reducing counterfeits cannot be achieved by using technological means only. Increasing awareness, fighting counterfeiters on a legal level, a good alert system, and having tamper-proof packaging are all important aspects. These factors combined with blockchain technology can lead to an efficient and comprehensive approach to reduce counterfeiting

Keywords: Block chain,Counterfeit Prevention.

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I INTRODUCTION

Although it may seem like a far off idea, we are surrounded by a lot of counterfeits. From fashion and retail products to software, digital media, electronics, piracy, and intellectual property, reports put the cost of counterfeiting somewhere around $600 bn a year in the US alone. In fact, the International Chamber of Commerce predicts that the —negative impacts of counterfeiting and piracy are projected to drain US$4.2 trillion from the global economy and put million legitimate jobs at risk by 2022. In Pharmaceuticals, the counterfeit medicine market is now responsible for around 1 million deaths per year, in an industry estimated to be worth $75 bn annually. In fact, the counterfeit medicine industry is estimated to be growing at twice the rate of legitimate pharmaceuticals, making it up to 25 times more lucrative than the global narcotics trade. Trust is a central element in all transactions. No matter if sending money or exchanging goods, it becomes difficult if there is no trust between the entities involved. It becomes even more difficult, as with many transactions, third parties are involved, such as banks. Often, not only one third-party is involved in a transaction, but multiple. An international money transfer does not only include the bank of the sender, the bank of the receiver, but also multiple intermediary entities such as clearing houses. The entities involved in the transaction do not only have to trust each other, but also the third parties. Removing these third parties can decrease transaction cost, facilitate faster transactions and add more transparency. Bit coin has successfully shown that removing such thirdparties is possible. The crypto currency permits direct sending coins to a transaction partner, without the need to use banks and clearing houses. The assets are directly transferred from one account to another. There are no intermediaries and thereby no need to trust third parties. In addition, the question if a transaction is valid is not answered by an institution, but by algorithms used. Therefore, it completely removes the need to trust any third party. The technology behind Bit coin, the blockchain, can however not only be used for financial transactions and crypto currencies in general. The technology has potential to —redefine the digital economy, because it allows immutable transactions, which can be checked at all times from everyone. This is because the

information is publicly available and distributed globally.

We now have more fakes than real drugs in the market — Christophe Zimmermann, the anti-counterfeiting and piracy coordinator of the World Customs Organization. Current anti-counterfeiting supply chains rely on a centralized authority to combat counterfeit products. This architecture results in issues such as single point processing, storage, and failure. Blockchain technology has emerged to provide a promising solution for such issues. In this paper, we propose the block-supply chain, a new decentralized supply chain that detects counterfeiting attacks usingblockchain and Near Field Communication (NFC) technologies. Block-supplychain replaces the centralized supply chain design and utilizes a new proposed consensus protocol that is, unlike existing protocols, fully decentralized and balances between efficiency and security. Our simulations show that the proposed protocol offers remarkable performance with a satisfactory level of security compared to the state of the art consensus protocol Tender-mint.

II. LITERATURE SURVEY

1. A Blockchain-Based Application System for Product Anti-Counterfeiting

Authors: JinhuaMa , Shih-Ya Lin , Xin Chen , Hung-Min Sun , Yeh-Cheng Chen And Huaxiong Wang

A decentralized Blockchain system with products anti-counterfeiting, in that way manufacturers cause this system to provide genuine products without having to manage direct operated stores, which can significantly reduce the cost of product quality assurance and can assure that the consumers getting genuine products without the involvement of trusted intermediaries.

2. PracticalAnti-Counterfeit Medicine management System Based on Technology.

Authors: Hoai Luan Pham, Thi Hong Tran and Yasuhiko Nakasima

A novel Blockchain based product ownership management method for product ownership management method for anti-counterfeit medicine system to resist the cloning of drug and improve the practical applicability. Analysis and evaluation results of our proposed system outperform the related proposals based on criteria about a practical application, anti-clone, low-cost oriented, and scalability. Furthermore, experimental implementation on a small

scale shows that our proposed system works appropriately in a real environment.

3. Authentication of Products & Counterfeit Elimination using Blockchain. Authors: TriptiRathee, Manoj Malik A

Blockchain" which provides an overview of different solutions in the anti-counterfeit area, different blockchain technologies and what characteristics make blockchain especially interesting for the use case. We have developed three different concepts of an existing system concept, is pursued further.Itis shown that reducing counterfeits cannot be achieved by using technological means only. Increasing awareness, fighting counterfeiters on legal level, a good alert system and having tamper proof packaging are all important aspects.

III SYSTEM ANALYSIS

EXISTING SYSTEM

In this paper author is using Blockchain technology to authenticate supply chain products as this product may be supplied from multiple third party distributors and this distributors can make clone/fake/counterfeits of this product BAR CODE and then manufacture fake products and add this counterfeit label to fake product and this fake products can cause huge loss of financial and lives if fake medicine manufacture. Not only supply chain any other online transaction require third party to complete transaction and peoples has to trust on third parties to complete their transaction and sometime this third parties can make fraud transaction or misuse user data

Limitations of Existing system

- We now have more fakes than real drugs in the market
- Cloning of product

PROPOSED SYSTEM

To avoid this problem author using Blockchain technology which does not require any third party and verification will be done by software algorithm itself without involvement of any third party. In this to avoid forge counterfeit we are converting all products details/barcode into digital signatures and this digital signatures will be stored in Blockchain server as this Blockchain server support tamper proof data storage and nobody can hack or alter its data and if by an chance if its data alter then verification get failed at next block storage and user may get intimation about data alter.

Proposed system Advantages:

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- In supply chain also all products barcode digital Blockchain signatures will be stored and if any third party distributor make clone of barcode then its signature will be mismatch and counterfeit will be detected.
    - Efficiency high.

IV IMPLEMENTATION

Architecture:

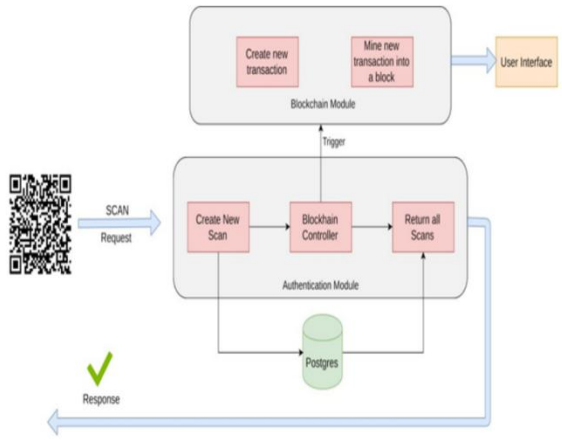

Fig-1. Architectures of the system model

MODULES

1. Data Collection

2. Data Pre-Processing

3. Feature Extraction

4. Evaluation Model

MODULE DESCRIPTION

1. Data Collection

Data used in this paper is a set of product reviews collected from credit card transactions records. This step is concerned with selecting the subset of all available data that you will be working with. ML problems start with data preferably, lots of data (examples or observations) for which you already know the target answer. Data for which you already know the target answer is called labelled data.

2. Data Pre-Processing

Organize your selected data by formatting, cleaning and sampling from it.Three common data pre-processing steps are: Formatting: The data you have selected may not be in a format that is suitable for you to work with. The data may be in a relational database and you would like it in a flat file, or the data may be in a proprietary file format and you would like it in a relational database or a text file. Cleaning: Cleaning data is the removal or fixing of missing data. There may be data instances that are incomplete and do not carry the data you believe you need to address the problem. These instances may need to be removed. Additionally, there may be sensitive information in some of the attributes and these attributes may need to be removed

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from the data entirely. Sampling: There may be far more selected data available than you need to work with. More data can result in much longer running times for algorithms and larger computational and memory requirements. You can take a smaller representative sample of the selected data that may be much faster for exploring and prototyping solutions before considering the whole dataset.

3. Feature Extraction

Next thing is to do Feature extraction is an attribute reduction process. Unlike feature selection, which ranks the existing attributes according to their predictive significance, feature extraction actually transforms the attributes. The transformed attributes, or features, are linear combinations of the original attributes. Finally, our models are trained using Classifier algorithm. 11 We use classify module on Natural Language Toolkit library on Python. We use the labelled dataset gathered. The rest of our labelled data will be used to evaluate the models. Some machine learning algorithms were used to classify pre- processed data. The chosen classifiers were Random forest. These algorithms are very popular in text classification tasks. **4. Evaluation Model**

Model Evaluation is an integral part of the model development process. It helps to find the best model that represents our data and how well the chosen model will work in the future. Evaluating model performance with the data used for training is not acceptable in data science because it can easily generate overoptimistic and over fitted models. There are two methods of evaluating models in data science, Hold-Out and Cross-Validation. To avoid over fitting, both methods use a test set (not seen byte model) to evaluate model performance. Performance of each classification model is estimated baseon its averaged. The result will be in the visualized form. Representation of classified data in the form of graphs. Accuracy is defined as the percentage of correct predictions for the test data. It can be calculated easily by dividing the number of correct predictions by the number of total predictions**.**

V RESULT AND DISCUSSION

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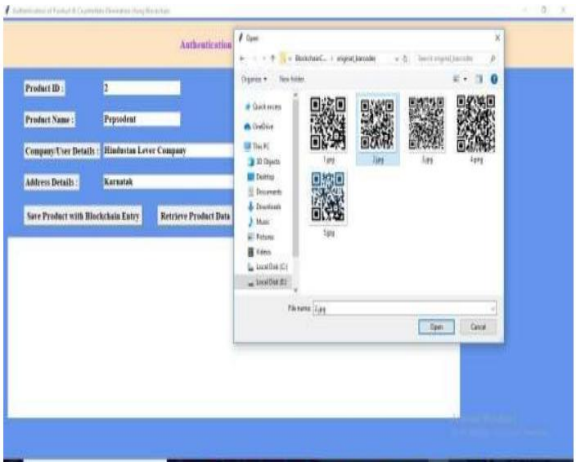
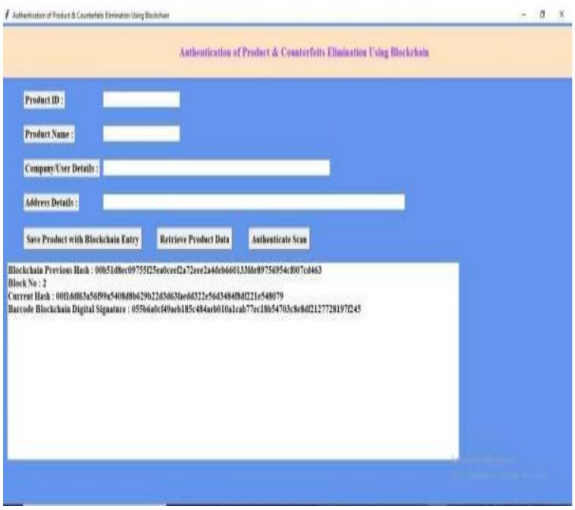
In above screen enter product details and then click on 'Save Products withBlockchain Entry'button to store product details in Blockchain



In above screen I entered product details and then selecting and uploading associatedBARCODE image and then click on 'Open' button to get below result



In above screen Blockchain generated new Block with id 2 and we can see Blockchain hash code of old and new transaction with uploaded bar code digital signature and all this details will saved inside Blockchain and now to search product details click on 'Retrieve Product Data' button to get below details.

In above screen I entered product id as 2 and then click on 'Retrieve Product Data' button to get above details. Now click on 'Authenticate Scan' button to upload product Barcode and then Blockchain will match this uploaded Barcode signature with available stored signatures and if match found then authentication will be successful else failed

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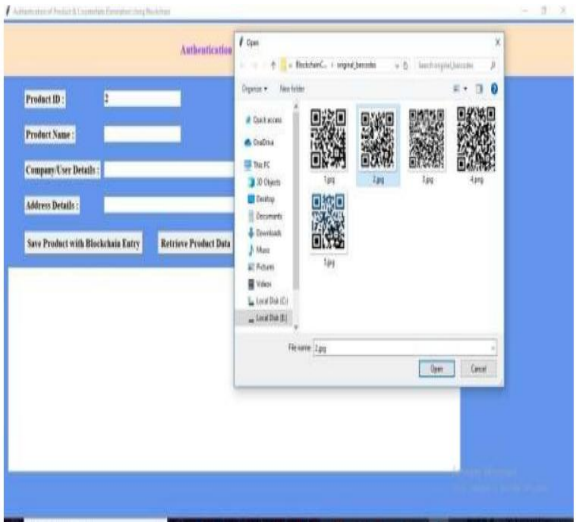
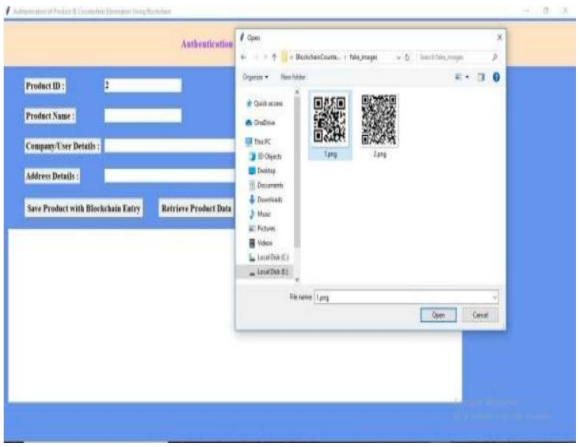


In above screen I am selecting and uploading '2.jpg' file and then click on 'Open' button to get below result

In above screen in browser author can see all authentication details uploaded product barcode. Now check with fake barcode by uploading from 'fake bar code 'folder



In above screen uploading barcode from fake folder and below is the result

In above screen in text area we can see uploaded bar code authentication failed.

VI CONCLUSION

With this system, the products journey from manufacturing to customer can be recorded, and the customer is assured that the scans weren'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. Manufacturer can also adopt RFID or NFC tokens instead of QR codesto further strengthen their system.

FUTURE ENHANCEMENT

Features expected to assist the users to confirm the genuineness of a pack. Such features will be significantly visible, and complex or expensive to reproduce. . This includes holograms, color shifting inks,

security threads, water marks etc. The advantage of overt technologies is that they can be checked by the end consumer.

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