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FAKE PRODUCT IDENTIFICATION USING BLOCKCHAIN

Mrs. Thejaswini M S[1], Sahil Bassan[2], S Manjot Singh[3], Mohit Singh[4], Prakrit Basnet[5]

CSE, KSSEM, Bengaluru, India[1-5]

Abstract: The manufacturing and marketing of counterfeit or duplicate products and goods leads to consequential financial, health and safety threat to end users. It also impacts on the economic growth of original manufacturers and businesses through revenue loss, product defamation, downtime, replacement expenses, forcing brands to spend money fighting counterfeits, trust among business partners can also be at risk, stealing sales etc. To overcome these crucial effects of counterfeiting, a blockchain based system is used in identification of original products and detects duplicate products to ensure the identification of original goods. In this work, with massive emerging trends in wireless technology, QR (Quick Response) codes and barcodes provides a robust technique to cut down the practice of counterfeiting the products. The fake products are detected using camera scanner, where QR or barcode of the product is linked toa blockchain in order to store product details and guaranteed unique code of each product as blocks in the database. If the code matches, the notification will be sent to the customer indicating the authenticity of the product and else if it does not match, a notification will be sent to customer that product is fake or counterfeited as well as to manufacturer about the place of purchase if customer accepts the request made by the application. This approachensures that consumers won't completely rely on merchants to determine if products are original or forged

Blockchain technology has opened the gate of creating decentralized applications, where security is a big concern. Here, any transaction ever held is recorded permanently. Over the years, some non-reputable sources have been publishing fake and attractive news stories. Due to the lack of any regulatory systems, this news cannot be verified. Hence, theseunreliable sources can publish whatever they want, and even in some cases, it makes chaos in society. In recent times due to the ease in internet availability and social media, inappropriate news can spread more quickly than ever before. In some cases, fake news is more attractive than the real one. Thus, people become misguided. Using the advantages of Blockchain\'s peer-to-peer network concepts, we will discuss a way to detect fake news in social media.

Keywords: Block chain, smart contracts, QR(Quick Response) code, anti-counterfeit.

I. INTRODUCTION

Today's industry is very competitive and committed to provide best possible products to the consumers. However, there are players those want to succeed overnight by offering the duplicate or counterfeit products similar to the others and known as pirated/ fake product. Recent trend shows the loss of Rs. 300 billion yearly for FMCG sector due to counterfeit products. The above factors brings the damage and loss the ecosystem. In a nutshell, the pirated products lead to (1) financial loss (2) customer safety (3) damage of the brand. The other industries like apparel, deluxe watches, chemicals, food items, medicines, beverages, medical equipment's, toys are hit badly by counterfeit products. This scenario is across the globe. In the import of European Union up to 5 % of the products are fake.

The brands those are worse hit by fake products are from US, Italy and France. The counterfeitactivities include invade design rights and patents, breach of copyright and physical counterfeit product (OECD, 2016).Therefore, it is a challenge for today's supply chains to tackle with this issue. The industry has moved to fourth revolution termed as Industry 4.0, that isexpected to use the internet of things (IoT), internet of services (IoS) and smart cyber-physical systems (Hofmann and Rüsch, 2017; Lu, 2017; Leeetal., 2015; Lasi et al., 2014). Industry 4.0 is expected touse and invest in the fault detection and prediction, self-learning technologies like artificial intelligence, additive manufacturing techniques and block chain technologies (Xu et al., 2018;Ivanov et al., 2016; Ivanov 2018, Xia et al., 2012). Despite of the advancement in the techniques and approaches adopted by the firms for today's business, the critical issue of piracy remains as it is and a pain point for firms. Considering the criticality of the issue with reference to Indian economy, it is important to recognize the sectors those are hard-hitted and where block chain technology find its application to identify the fake products.

The blockchain technology can utilize the available data to detect the indicative fraud and is cheaper and faster. Additionally, by using the technology like blockchain, one can avoid human and expert errors. Therefore, in this paper, authors have made an attempt to develop a mechanism for future monitoring and planning for different sectors of India

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with the help of blockchain technology. The SWARA- WASPAS methodology is applied for developing a decision system to address the following research questions:

R1: Which are the major sectors hit by counterfeit products?
R2: What is weightage of each sector with respect to counter-feiting?
R3: Which sectors needs to be addressed on priority to com- bat the counterfeiting problem?

II. RELATED WORK

[1] G. Vidhya Lakshmi, Subbarao Gogulamudi, Bodapati Nagaeswari, Shaik Reehana, "Blockchain Based Inventory Management by QR Code Using Open CV", International Conference on Computer Communication and Informatics (ICCCI -2021) Coimbatore, INDIA, Jan. 27 – 29, 2021. Here, they are using blockchain technology and Python to generate QR codes. They then used this technology to create a website that will allow users to manage their inventory. They are using the features of blockchain and QR code to create a reliable and transparent inventory management system. Through the use of Python, they can create QR codes that are customized for different products. The details of the sold products are then broadcasted through the P2P network[1]. A manufacturer can quickly compute inventory by retrieving product details from the blockchain database-EVM is a Python-based implementation of the Ethereum protocol. It includes low-level primitives for the present Ethereum 1.0 chain, as well as support for the future Ethereum 2.0 specification. They used Py-EVM to construct the Ethereum blockchain for storing details of sold-out products[1]. This is a base paper we referred to develop this system. Here they are using Ethereum blockchain technology and using python to generate QR code which can be improvised by using algorithm in blockchain technology. Here, they usedthis technology for inventory management and we used this information and improvising this by creating a website and using for the purpose of fake product[1].

[2] Abhinav Sanghi, Aayush, Ashutosh Katakwar, Anshul Arora, Aditya Kaushik, "Detecting Fake Drugs using Blockchain", International Journal of Recent Technology and Engineering (IJRTE) ISSN: 2277-3878, Volume-10 Issue1, May 2021 This paper helps in tracking the movement of drugs from the industry to the patient. Mainly the Hyperledger fabric is used for implementing the entire model. In this model, the manufacturer has to upload the details of a drug in a website which is sent further to the government for approval. Once the government approval is done, the pharmacies can request the approved drugs with the help of blockchain technology. Further, if any patient needs to get some medicine or drugs, then a request is made into the blockchain network. After that a medical officer or doctor will approve or reject the request. Because the entire model is implemented in a blockchain network, it can help in preventing the counterfeiting of drugs and we can track the movement of drugs from the manufacturer up to the patient. This paper gives us information mainly about the Hyperledger which can be implemented in our proposed system and the details of different genres to approve the product in this area [2].

[3] Steven Sandi, Sanja Radonjic, Jovana Drobnjak, MarkoSimeunovic, Biljana Stamatovic and Tomo Popovic" Smart Tags for Brand Protection and Anti-counterfeitinginwineIndustry" 23rd International Scientific- Professional Conference on Information Technology (IT), 2018. They describe a brand protection and anticounterfeiting solution based on smart tags and Cloud enabled technologies for the wine sector in this article. One of the key concepts behind smart tags is to use functional inks and quick response codes, which consist of Cloud system andallow for two-way communication between end user and the winemaker[13].

It is envisaged that the proposed approach will make wine counterfeiting difficult and unprofitable. The two way communication between different users is facilitated by mobile application and cloud storage like wine makers, retailstores and consumers. In this proposed system, there are also advanced Near-field Communication (NFC) sensor which can be used as well in order to increase the security in QRcode the photochromic inks are used. Photo chromic in kreverts to its original condition and becomes invisible once the source of the light has been removed. When a second layer of photochromic ink is printed over a conventional QRcode, it becomes a dual state QR code[13]. As a result, this study explains how secure the product counterfeit is using various technologies such as QR codes, Photo chromic ink, and Open sensing tags. Hence this paper lets us know more about how secure the product counterfeit using different technology

III. PROPOSED METHOD

The hybrid approach of multi-criteria decision making(MCDM) is considered in this research (Zolfani et al.,2013).This methodology can be applied to the decision making by top management and policy making in realsituations. Total 20 experts have been consulted for the scores on different dimensions. After receiving the scores for the criteria 1 (C1-Potential) and criteria 2 (C2-Need)the weights have been calculated using SWARA, whereas WASPAS was used to

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properties the sectors for block chain application. Appendix-A highlights the potential and need of blockchain for different stakeholders.

Experts view on criteria's determining the SWARA method. Each expert gives the importance of each criterion. In the process most important and influential criteria gets the first rank and least gets the last. SWARA is useful in the situations where priorities may exist but weights of the criteria are pivotal. SWARA's framework is different from othersimilar techniques such as AHP and ANP. The procedure for determining the weights on the basis of SWARA is adopted from Keršulienė et al. (2010).

CHALLENGES IN FAKE REVIEW DETECTION:

1) Counterfeiting is one of the biggest challenges to theauthenticity of real products. An estimated 9-0% of the business has an estimated average counterfeit value, which can cause revenue loss and spoil the brand name. The issue of genuine product launch is the primary challenge in the market.
2) Vendor point of view: Sometimes it is found that sellers are rewarded with websites that promote their products to offer higher discounts and improve the value of the product through fake reviews. These things make it very difficult to find the genuine product [16].
3) Customer point of view: lack the knowledge about the counterfeit product, so people / customer cannot differentiate real and fake products
4) Domain point of view: We need to focus more research on counterfeit products and we use modern technology. Modern technology used to store inventory of finished products. With the information thus collected, customers can determine the authenticity of the product using the mobile apps they have when purchasing a product.
5) The block market is one of the biggest challenges for state and local bodies, and the government has introduced many laws and regulations against counterfeit products even though the government cannot control counterfeit products.

IV. CONCLUSION

Author(s) answered the three research questions proposed in the introduction section and hence justifies the contribution. Keeping in view that counterfeiting is huge and critical concern for number of industries and to the creation of business network including the risk of security and safety to the consumers of the goods, more research towards strengthening the legal framework should be conducted. Blockchain can be used for better governance intermsof proof of existence, notary, law and public administration. Blockchain can help in better healthcare system. Further the blockchain can be explored for better data management from different domains. Another interesting area for government may be e-voting. Blockchain technology can be further explored for e-business performance and secured supply

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