



A Survey Paper On Mechanisms For Fake Product Identification Using Android

Pratik Raut, Sayali kekan, Dr. Nikita Kulkarni, Prof. Prashant raut, Prof.Geentanjali Bansod.

Dept of Computer Engineering
KJ College of Engineering Management & Research

Abstract- The manufacturing as well as marketing of counterfeit or duplicate products and goods lead to consequential financial, health, and safety threats to end users. It also hurts 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 the 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 provide a technique to cut down the practice of counterfeiting products. The fake products are identified using a camera scanner, where the QR or barcode of the product or goods is linked to a blockchain to store product details, and the guaranteed unique code of each product is stored as blocks in the database. If the code in the product matches, the notification will be sent to the customer indicating the authenticity of the product and if it does not match the code in the database, a notification will be sent to the customer indicating that the product is fake or counterfeited and notification is also sent to the manufacturer about the place of purchase if the customer accepts the request made by the application. This approach to cutting down counterfeit ensures that consumers won't

completely rely on merchants to determine if products are original or forged.

Keywords- Counterfeit Products, Cryptography, Encryption, Decryption, QR Code, Mobile App, Webservice

I. INTRODUCTION

The global development of the product or branded product always comes with risk factors such as counterfeiting and duplication of products 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 the sales, reputation, and profits of the companies and also poses a fatal threat to unsuspecting buyers. 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 product builders, original manufacturers face the biggest problems and huge losses in the 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, a 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's 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 the 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.

II. PROBLEM DEFINITION

It is hard to find genuine reviews among millions of reviews. So, there is a need for a system to find out genuine reviews. A company might hire someone to write fake reviews to falsely promote their product. So, that's why fake product review monitoring system is needed.

III. LITERATURE REVIEW

1. Paper Name: Detection of fake opinions on online products using Decision Tree and Information Gain.

Author: Sanjay K.S, Dr.Ajit Danti

abstract:- Online reviews are one of the major factors for the customers to purchase any product or to get service from many sources of information that can be used to determine the public opinion on the products. Fake reviews will be published intentionally to drive the web traffic towards the particular products. These fake reviewers mislead the customers to distract the purchaser's minds. Reviewers' behaviors are extracted based on the semantical analysis of their review content to identify whether the review is fake or not. In this work, the reviews are extracted from the web for a particular product, along with the reviews of several other information related to the reviewers also been extracted to identify the fake reviewers using the decision tree classifier and Information Gain. The significance of the features on the decision is validated using information gain. Experiments are conducted on an exhaustive set of reviews extracted from the web and demonstrated the efficacy of the proposed

approach.

2. Paper Name: FAKE PRODUCT DETECTION USING BLOCKCHAIN TECHNOLOGY

Author : 1Nruithya Ganapathy B , 2Keerthan Kumar

abstract:- The manufacturing as well as marketing of counterfeit or duplicate products and goods leads to consequential financial, health, and safety threats to end users. It also hurts 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 the identification of the original products and also detects duplicate products to ensure the identification of the original goods. In this project, with massive emerging trends in wireless technology, QR (Quick Response) codes and barcodes provide a technique to cut down the practice of counterfeiting the products. The fake products are identified using the camera scanner, where the 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 the 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 the database, a notification will be sent to the customer indicating that the product is fake or counterfeited and a notification is also sent to the manufacturer about the place of purchase if the 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.

3. Paper Name: Fake Product Detection using Image Processing

Author : Pooja C P1 and Arunkumar K L2

Nowadays, the entire globe has grown up every day, and similarly, technology has also grown up. So, my project is fake product detection. The people

can know whether the products are fake or original in all the counterfeit products. In my project I, have mainly taken the product Bisleri bottles using image processing with Python language is used to identify the original or fake product using the key feature extraction with of open CV module we can identify the product.

My project targeted on distance and key points of the train image and inputted image.

By computing those images we can easily find out the original and fake product.

4. Paper Name: A Novel Approach For Detect Counterfeit Products Using Color QR Code

Author: B.Prabhu Shankar, Dr.R.Jayavadivel, T.Viswanath Kani

abstract:-Counterfeiting is one of the biggest challenges to the authenticity of the original product. Counterfeit goods generate 15-20 percent revenue loss on average businesses. To combat this situation, product manufacturers use holograms and barcodes. Therefore, customers cannot guarantee the reliability of a product. Therefore, with the growing trends in mobile and wireless technology; rapid response (QR) codes provide a robust mechanism for counterfeit products. QR codes and color QR codes are primarily used in security and proprietary applications. Many mobile applications use QR codes for secure login and receive product information. Our proposed approach uses QR codes based on 2 Dimensional color QR codes to recognize the originality and reliability of a product.

5. Paper Name: DESIGNING A COUNTERFEIT-PRODUCT-CHECK APPLICATION USING ANDROID-BASED BARCODE SCANNER IN COSMETICS PRODUCTS

Author : Delima Sitanggang * , Juan1 , Greace2 , Evta Indra3

abstract:-In this day and age, all information can be searched and obtained from technological developments. The more users of technology such as smartphones/androids among the wider community, the more information that can be obtained. Currently, there are many cases of violations of cosmetic circulation in Indonesia. Such as the

circulation of products without a registration code from the BPOM (Food and Drug Supervisory Agency) which is faked by irresponsible parties. Of the many cases of cosmetic violations, along with changes in people's lifestyles such as changes in consumption patterns (users). At this time, public knowledge is still minimal about choosing and using safe cosmetic products. The application of cosmetic safety check applications is an option for consumers because with this application they can check for themselves whether the products to be used are genuine or fake. The method used in this study is to use qualitative methods and the waterfall method. This application is expected to help the public before buying a cosmetic product, simply by checking the barcode and scanning using a smartphone/android, consumers can quickly find out whether a cosmetic product is genuine or not before using it.

6. Paper Name: Counterfeited Product Identification in a Supply Chain Using Blockchain Technology

Author : Shivam Singh1 , Gaurav Choudhary2 , Shishir Kumar Shandilya1

abstract:-Since the invention of Blockchain technology in 2008, it has been used in many domains to ensure high security and reliability of data, like the use of Bitcoin to BaaS (Blockchain as a Service) which is a new blockchain trend and is a sort of cloud-based network for organizations in the business of building blockchain-based applications. This paper implements the combined approach of the decentralized Blockchain technology and the Supply Chain to establish that the end-users in a supply chain do not completely rely on the trader to establish that the product is counterfeited or not and this can be done by authenticating the product at every stage in the Supply Chain by using One Time Passwords on the receiver's mobile phone along with a deployed personnel who will be responsible for assuring the quality of products. Furthermore, using this combined technical approach can considerably lower the cost of product quality assurance and this proposed system will track the authenticity of the product from its origin from the manufacturer to the

end-user as well.

7. Paper Name: Fake Product Monitoring System Using Artificial Intelligence

Author: Ms. Reema Anne Roy¹, Dr. Sunita R Patil²

The problem of recognizing counterfeit (fake) products is a tedious task in certain cases and can be dangerous when it comes to medical products. It becomes easier to produce and sell fake products if an individual does not check the details of the product properly. This paper suggests a better solution using Artificial Intelligence for non-tech-savvy customers who can scan the product with the help of a mobile application to identify if the product received is fake or original. The major focus will be on the detection of logos (both image and textual representation).

8. Paper Name: VERIFYING AUTHENTICITY OF PRODUCTS BASED ON BLOCKCHAIN AND QR CODE TO AVOID COUNTERFEITING

Author : Jayashree Katti^{*1}, Sonali Patil^{*2}

abstract:-According to the report of Global Brand Counterfeiting in 2018, the losses that occurred because of counterfeit products globally were around 323 billion USD. The market for counterfeit and fake products is rising day by day. The counterfeit market can affect the country's growth. Counterfeit products are often manufactured to benefit from the cheaper value of the copied product. Most of the companies are trying to make more efforts to avoid counterfeiting. QR codes can be used as effective and low-cost solutions that can help industries and customers check the reliability of the product. Generating and printing a QR code on the product for identification is a simple and cheap process. The proposed system uses a QR code because it is easy to implement. To check the authenticity of a product, this paper uses a distributed blockchain technology system which ensures that customers do not rely on third-party apps.

IV. RESEARCH METHODOLOGY

Nowadays online shopping is leading, and because of fake reviews, the ratings of branded products are down. The major task is to focus on identifying fake reviews. The Decision Trees classifier Technique is used in this work, reviews have been extracted and collected to identify the fake review by using six different conditions that is star ratings, Response, Reply, Useful Profile, Profile status, and Template conditions. In this paper, online reviews of the product are extracted by using a Web Harvy crawler. Potential features are extracted from the set of collected reviews, and then the rules for the Decision Rule Classifier to segregate the fake reviews by using the decision Classifier technique based on several criteria. The final step is to identify the best feature to determine review is fake or not. The overall architecture of the proposed Fake review Identification model is shown below in Fig 1.

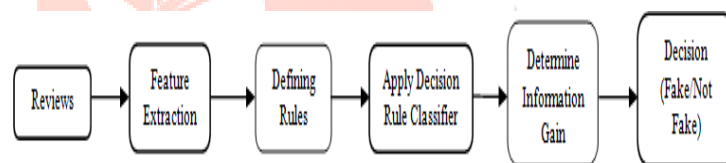


Fig 1: Block Diagram of the Proposed method

The following rules are defined to identify whether reviews are fake or not.

- R1(Response): It is to check whether the reviewer got any response for his review. Generally when a reviewer writes a fake review on any particular product then company people will respond to the review quickly.
- R2(Useful profile): This is to check whether the reviewer's profile is useful or not. If the reviewer profile is a real profile then people will like the reviewer profile by stating "Use full information". If the reviewer is giving the misleading statements then will not be liking the profile.
- R3(Template): This is to check whether the reviewer uses a standard Template or Not. If the review contains Template then

definitely the review will be fake. If the reviewer wrote any negative or positive review within one sentence without stating the reason then it is fake.

- R4(Stars < 2): This is to check how many ratings the reviewer has given. Without any reason if the reviewer has given less than 2 ratings then it will be a fake review.
- R5(Reply): This rule is to check whether the reviewer has replied to the response from the company. If the reviewer is not a fake then definitely he will be replying for the response.
- R6(Thick): This rule is to check the thickness of the reviewer profile. The reviewer profile has full information (Thick) about his details which indicates the reviewer is not a fake person the reviewer profile does not contain any detailed information (Thin), considered a fake review.

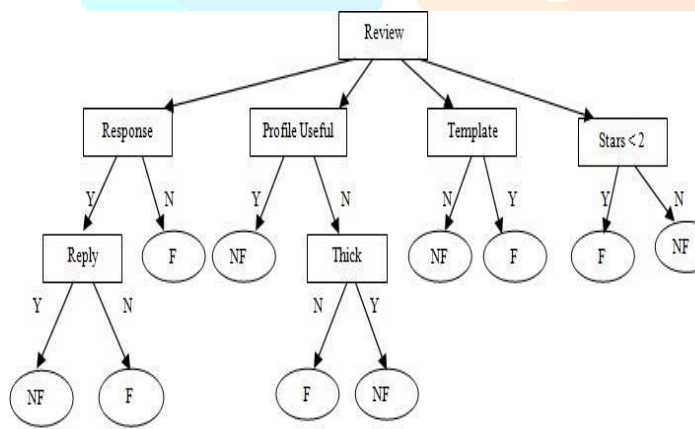
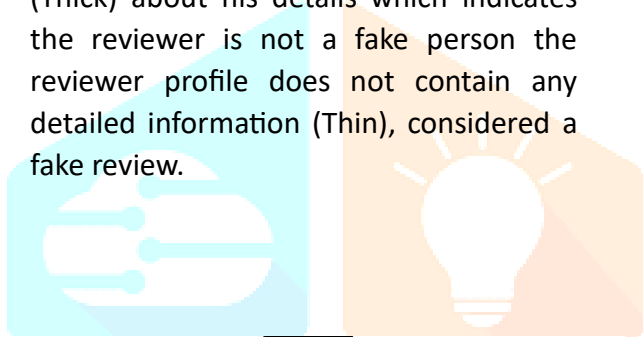


Fig 2: Decision Rule classifier tree.

Here: F=Fake, NF=Not Fake, Y=Yes, N=No.

Algorithm for decision rule classifier.

- Start
- Read the review and its features such as Response, Useful profile, Template, Stars ratings, Reply, and Thick.
- If the response to the review is yes and there is no reply for a response then it is a

fake review otherwise it is not a fake

| | |
|---|--------|
| Number of Reviews collected | 200 |
| Product | LED TV |
| Website Amazon | Amazon |
| Fake Reviews Identified Using Proposed Method | 90 |
| Fake Reviews Identified Manually | 94 |
| Success rate | 96 % |

review.

- If the reviewer profile is not useful and not thick then it is a fake review.
- If the review uses a template then it is a fake review otherwise it is not a fake review.
- If the star rating is less than 2 then it's a fake review otherwise it is not a fake review.
- Stop.

V. EXPERIMENTAL RESULTS

Huge data from the web will be collected using the WEB Crawler to get the online reviews. The web Crawlers extract all the reviews from the web and store them in the form of text documents. In this work Web harvy tool is used for collection of data and experimentation. Dataset is prepared by collecting the reviews of the web users on the product called "LED TV" from the website "www.amazon.com", 200 online reviews are collected for experimentation. From 200 reviews, 90 reviews have been detected as fake reviews. The decision of the proposed approach is validated by manual review analysis, in which 94 reviews are detected as fake. Hence the success rate of 96 % has been achieved as shown in Table 1.

Experimental result shows the efficiency of the proposed system. Table 2 shows the sample fake reviews of the product.

Table 2: Sample experimental results for fake reviews of a product.

| Sr.No. | Details | Review 1 | Review 2 |
|--------|----------------|--------------------------|-----------------|
| 1 | PRODUCT | LED TV | LED TV |
| 2 | REVIEWS | Not a worthwhile product | Waste of Money. |
| 3 | STARS | 1 | 1 |
| 4 | RESPONSE | N | Y |
| 5 | REPLY | N | N |
| 6 | USEFUL PROFILE | 1% | 1% |
| 7 | PROFILE STATUS | Thin | Thin |
| 8 | TEMPLATE | Yes | Yes |

The above table shows the two methods to identify the best feature among these. The Entropy value will be the same for all the measures here because of the same leaf nodes at the left and right. The Information Gain value is 0.3 which is High for Response, Reply, and Profile Useful, and Thickness and Information Gain 0.2 which value is low for Template and Stars < 2 i.e 0.2 when compared to others. This indicates that the Response, Reply, and Profile Useful, Thickness will be the best feature to find out the accurate fake review. Information is needed to specify the exact physical state of a system, given its macroscopic. Entropy is an expression of the disorder, or randomness of a system, or the lack of information about it. The concept of entropy plays a central role in information theory. Entropy is the degree of randomness of elements determined using the equation (1).

$$\text{Entropy, } E(x) = - \sum p(x) \log p(x) \quad (1)$$

Where $P(x)$ is the probability of x .

Information Gain is nothing but the Identification of the best feature in the working set, that gives us less impurity. The amount of information gained about a random variable from observing another random variable. However, in the context of decision trees, the term is sometimes used synonymously with mutual information, which is

the conditional expected value of the Kullback–Leibler divergence of the univariate probability distribution of one variable from the conditional distribution of this variable given the other one.

IG(x)

$$\Sigma ch = 1(E(x) - W * E(c))$$

Where,

$E(x)$: entropy of node x

W : Weighted avg.

$E(\text{child})$: Entropy of child

The information gained with the highest value is considered the best or most significant feature in the identification of review is fake or not.

VI. CONCLUSION

In this project, the research identifies the fake and original images of Bisleri and other products used. This project presents extensive research on fake product detection. So, in this project strong need to detect fake products, and image processing Python is used to detect the images. Using different methods of feature extraction we can differentiate the images. It can be helpful for the end user of the product. Knn is the main algorithm used in this project to find out the key points of images. The focus of this project is to implementations have a practical impact on counterfeiting products and the affecting the image processing with Python to detect depends on how the consumer can easily and simple way to interact with the system. Using image recognition, the approach can improve fake product detection.

REFERENCES

1. F. Ayu and A. Mustofa, "Sistem Aplikasi Absensi Menggunakan Teknologi Barcode Scanner Berbasis Android," *It J. Res. Dev.*, vol. 4, no. 2, pp. 94–103, 2019, doi: 10.25299/itjrd.2020.vol4(2).3642.
2. E. Indra et al., "Analisis Dan Perancangan Sistem Absensi Mahasiswa Berbasis

QR Code (Studi Kasus Di Universitas Prima Indonesia),” Semin. Nas. Inov. Teknol. dan Ilmu Komput. 2019, pp. 105–118, 2020, [Online]. Available

3. I. P. A. Putra Yudha, M. Sudarma, and P. Arya Mertasana, “Perancangan Aplikasi Sistem Inventory Barang Menggunakan Barcode Scanner Berbasis Android,”

J. SPEKTRUM, vol. 4, no. 2, p. 72, 2018, doi: 10.24843/spektrum.2017.v04.i02.p10.

4. P. Studi, T. Informatika, F. Teknik, and U. P. Bangsa, “Skripsi Monitoring Inventory Menggunakan Qr Code Scanner Berbasis Android Studi Kasus Di Pt Ikeda,” 2020.

5. Y. I. Nyayu, “Aplikasi Container Location Menggunakan Barcode Scanner Berbasis Android Pada Pt. Pelabuhan Indonesia Ii (Persero) Cabang Palembang Dengan Metode Agile,” 2018.

6. H. Herry, “Aplikasi Info Halal Pada Kosmetik Menggunakan Barcode Scanner Untuk Smartphone Dengan Metode Prototyping Berbasis Android,” 2018, [Online].

Available:
<http://repository.uharajaya.ac.id/1386/4/201310225147HerryHaryanto-BABV.pdf>.

7. I. G. Banjar Jawi, “Pemindaian QR Code Untuk Aplikasi Penampil Informasi Data Koleksi Di Museum Sangiran Sragen Berbasis Android,” Emit. J. Tek. Elektro, vol. 17, no. 1, pp. 6–8, 2018, doi: 10.23917/emit.v17i1.5917.

8. C. A. Febiyanti, “Implementasi Barcode Scanner Pada Aplikasi Cek Harga Dan Hitung (SiCeking) Berbasis Mobile,” J. Teknol. dan Sist. Komput., vol. 6, no. 2, pp. 26–33, 2018.

9. Da – ChunWu Yuan – Ming -Wu, 2020 “Covert Communication via the QR Code Image by a Data Hiding Technique Based on Module Shape Adjustments

10. M. Pasca Nugraha., Dr. Ir. Rinaldi Munir M. T. 2011 “ Pengembangan Aplikasi QR Code generator dan QR Code Reader dari data berbentuk Image, Konferensi Nasional Informatika – KNIF, ISSN 2087 – 332

11. Pooja Sharma and Rupali Bhartiya “ Implementation of decision tree Algorithm to the analysis of performance” International Journal of Advanced Research in Computer and Communication Engineering”, Vol. 1, Issue 10, December 2012, ISSN: 2278- 1021.

12. Qing-yun Dai, Chun-ping Zhang, and Hao Wu “ Research of Decision Tree Classification Algorithm in Data Mining” International Journal of Database Theory and Application, Vol.9, No.5 (2016), pp.1-8, ISSN: 2005-4270 IJDTA.

13. Rajashree S. Jadhav and Deipali V. Gore “A New Approach for Identifying Manipulated Online Reviews using Decision Tree” International Journal of Computer Science and Information Technologies, Vol. 5 (2), 2014, 1447-1450, ISSN-0975-9646.

14. Rashmi Gomatesh Adike and Vivekanand Reddy “Detection of Fake Review and Brand Spam Using Data Mining Technique” International Journal of Recent Trends in Engineering and Research, Volume 02, Issue 07; July - 2016, ISSN: 2455-1457.

15. Salma Farooq and Hilal Ahmad Khanday “Opinion Spam Detection: A Review” International Journal of Engineering Research and Development, Volume 12, Issue 4, e-ISSN: 2278-067X, p-ISSN: 2278-800X, April 2016.