I. J. Education and Management Engineering, **2024, 6, 20-31**
Published Online on December 8, 2024 by MECS Press (http://www.mecs-press.org/)
DOI: 10.5815/ijeme.2024.06.02

A Fake Product Identification and Prevention System Using Blockchain Technology

Kakelli Anil Kumar*
SCOPE, Vellore Institute of Technology, Vellore, 632014, India
Email: anilsekumar@gmial.com
*Corresponding Author

Suman Tandan
SCOPE, Vellore Institute of Technology, Vellore, 632014, India
Email: sumantandon2056@gmail.com

Atul Koirala
SCOPE, Vellore Institute of Technology, Vellore, 632014, India
Email: atul.koirala2019@vitstudent.ac.in

Received: 01 September, 2023; Revised: 02 November, 2023; Accepted: 08 December, 2023; Published: 08 December, 2024

Abstract: Blockchain technology can revolutionize product authenticity verification by utilizing decentralized networks to collect and retain product data. This generates an irrevocable record of a product's path from manufacture to sale, making it possible to detect phony or counterfeit goods, a problem that plagues many different industries.

A common problem that compromises consumer confidence and harms brand integrity in a variety of businesses is counterfeiting. Our strategy involves establishing a blockchain-based product registry, allowing various supply chain nodes, including production and store shipping, to update information such as origin, materials, and certificates. Smart contracts also provide various applications for detecting fake goods, thus preventing the introduction of counterfeit goods into the supply chain. Based on predefined standards, these self-executing contracts validate the product's legitimacy. Blockchain technology makes it possible to verify things accurately, ensuring that customers receive the real goods they pay for. Our system enables accurate verification, ensuring that customers receive genuine goods. by scanning a QR code that connects to the blockchain record, customers can instantly authenticate the legitimacy and history of a product, ensuring its authenticity. By offering a clear picture of the product's route, this approach boosts consumer trust by ensuring a high level of security and traceability. This method offers a safe and effective solution to the age-old issue of product authenticity because of its decentralized structure and immutable record-keeping. This is a breakthrough in fighting counterfeiting and maintaining product integrity by empowering customers, defending brands, and encouraging a more trustworthy marketplace.

Index Terms: Blockchain technology, Immutable records, Counterfeit detection, Transparent supply chain, Smart Contracts, Decentralized networks

1. Introduction

A widespread problem that impacts many businesses, counterfeiting can result in large financial losses, weakened brand integrity, and jeopardized customer safety. Sophisticated counterfeiters are increasingly eschewing conventional means of authenticating products, such as barcodes and holograms. These traditional methods frequently rely on centralized systems that are open to manipulation and lack the transparency needed to reassure customers about the legitimacy of the product.

Our project intends to create a blockchain-based system for identifying counterfeit goods to track and confirm their legitimacy. The principal aims of this project are to create a blockchain-driven product registry, apply smart contracts for automated validation, and improve consumer confidence by implementing a QR code verification procedure. This study examines the benefits of smart contracts, shows that employing blockchain technology for anti-counterfeiting is feasible, and assesses how the system affects consumer confidence. The paper is organized as follows: results, conclusions, system design, and theoretical background.

1.1 Theoretical Background

A blockchain-based fake product identification system monitors and verifies product authenticity using blockchain's decentralized tamper-proof properties. The blockchain technology records transactions in a safe, open, and immutable distributed ledger. Each block hashes before creating an immutable chain of transactions. This implies that blockchain transactions cannot be changed or eliminated. Blockchain technology can create a tamper-proof record of a product's journey from the manufacturer to the client to avoid counterfeiting. This document describes the product's history, materials, manufacturing, and distribution. When information is recorded on a blockchain, counterfeiters have trouble making legitimate fakes. Blockchain-based technology immediately detects, and reports attempts to introduce fake items into a supply chain. Smart contracts can enhance the temper-proof properties of blockchain technology to protect blockchain-based anti-counterfeiting systems. Smart contracts are pre-programmed to be executed automatically under certain conditions. Smart contracts can enforce anti-counterfeiting laws.

Furthermore, blockchain's decentralized structure guarantees that no one party controls the entire network, lowering the possibility of fraud and manipulation. Transparency and accountability are increased since everyone involved in the supply chain, from producers to retailers, may view and validate the product information kept on the blockchain. Blockchain technology is appropriate for application in global supply chains because of its scalability, which enables it to manage high numbers of transactions efficiently.

In Conclusion, blockchain technology provides a solid theoretical foundation for creating a system for identifying and preventing counterfeit goods. It is the perfect answer for dealing with the problem of counterfeit goods in a variety of businesses because of its fundamental values of decentralization, security, immutability, and transparency. [1].

1.2 Motivation

Counterfeiting threatens consumer health, confidence, and corporate revenue. Therefore, counterfeiting tactics are urgently required. A blockchain-based false product identification system has the potential to

revolutionize the battle against counterfeiting. Providing a secure log of a product's journey from the factory to the customer can prevent the introduction of fake goods into the distribution network. This approach verifies the product's authenticity by ensuring transparency and traceability. This method can aid food, pharmaceutical, and luxury products companies [2]. A Blockchain-based counterfeit detection method can halt counterfeiting and ensure product authenticity. Security and transparency protect consumers from health risks and corporations from missed revenue. This system can disrupt numerous industries, including the food, pharmaceutical, and luxury goods sectors.

1.3 Aim of the proposed work

Blockchain technology can change the verification of product authenticity. A decentralized network can capture and preserve product information to build an immutable record of a product's path from creation to sale. This is important in spotting fraudulent or counterfeit items, which is a serious concern for many businesses. Blockchain technology can detect phony products by creating product registers. The origin, resources, and certificates of each product are listed in the register. The registry can obtain these data when the product is made or transported to a store. Smart contracts can be used to detect bogus products using blockchain technology [3]. This self-executing contract can automatically validate product authenticity using preset criteria. An immutable record of a product's manufacturing through sale may validate its validity with high precision, guaranteeing buyers what they pay for. A Blockchain-based fake product identification system can minimize counterfeit items by offering a more transparent and safe approach for checking product authenticity. A Blockchain-based system can also help build trust and confidence in the market by providing customers with a more reliable way of checking the accuracy of goods. This can lead to increased sales and income for the business. A blockchain-based false product identification system has several advantages, and as technology grows, it will certainly be adopted in more sectors and applications.

1.4 Objective

The main goal of using blockchain technology to find fake products is to ensure that people can buy real products and that companies can sell real products without being hurt by fake or copycat products. The results of this study have several implications [4]:

- **Protecting consumers' false** products can be dangerous or of poor quality, endangering consumers and harming legitimate businesses' reputations.
- **Protecting businesses:** Fake products can eat legitimate business profits. because they can be sold at a lower price and dilute the brand value.
- **By promoting fair competition** by detecting and preventing the sale of counterfeit goods, the playing field can be leveled, and fair competition can be promoted.
- **Supporting economic growth** Counterfeiting can harm economic growth by decreasing the demand for legitimate products and discouraging innovation.

1.5 Literature Survey

Blockchain technology can help untrusting parties to trust each other and prevent counterfeit items by allowing producers to upload real serial numbers to a ledger. By establishing a trustworthy environment where customers can confirm a product's validity before buying it, blockchain ensures that data cannot be tampered with [5]. The industrial sector is facing a serious issue with the counterfeit goods system [6], which impacts business reputation, sales, and profitability. Blockchain technology can be used to authenticate and spot counterfeit goods by leveraging a decentralized, secure, and unchangeable digital ledger. Blockchain and Bitcoin were utilized to determine the authenticity of fake items in this investigation [7]. Fraudulent items that are not registered or labeled by vendors or manufacturers are increasing in popularity because of their low cost and likeness. This system [18] proposes the use of a technique for detecting fake goods by scanning distinctive QR codes. Ownership-tracking technology proves purchase and validity, decreasing anticounterfeiting expenditures.

This method [9] delivers notifications to customers and producers regarding the legitimacy of items, preventing consumers from entirely depending on retailers to assess product authenticity. By connecting the codes to a database of product facts and distinctive codes, a blockchain-based system can identify and detect fake goods. This study offers [10] an original remedy for the growing problem of fake news fostered by the Internet of Things (IoT) and the Internet. By employing blockchain technology, it aims to protect news data, enhance the ability to trace fake news, and ensure authenticity. The proposed technique enhances verification with a cooperative storage model and an updated polynomial commitment algorithm to maintain data consistency between the on-chain and blockchain sources. This study examined how blockchain technology can be used to prevent product fraud [11]. The transparency and immutability of blockchain technology produce an unbreakable record of the background and origin of a product. Smart contracts allow producers to register their products and buyers to verify the legitimacy of their purchases. The benefits include stakeholder collaboration, reduced fraud, and transparency. Blockchain has the potential to revolutionize anti-counterfeiting efforts and provide a secure market. In this work, [12] a program for blockchain- and QR code-based student certificates will be developed. Driving causes include the need for real-time authentication, proliferation of fake certificates, and impersonation. The system employs object-oriented analysis and design and uses both QR codes and blockchain to authenticate users. It was developed using SQLite, Python Flask, and Bootstrap. An online certificate verification system that eliminates counterfeiting promotes education and simplifies authentication for companies and recruiters is expected. Blockchain [13], which has recently attracted considerable interest, offers several practical applications. Bitcoin uses blockchain to verify transactions; therefore, people cannot spend the same money twice.

The underlying concept of the blockchain guarantees data integrity. This study uses decentralized blockchain technology to showcase the capability of customers to autonomously verify the authenticity of a product. This study introduces a blockchain framework that effectively eliminates counterfeit products, allowing producers to produce genuine items independently of merchant collaboration. This technique results in a significant decrease in the expenses incurred to check the quality of the product. The potential of blockchain technology, which has gained popularity in financial transactions, is substantial. [14] The elimination of intermediaries facilitates expedited and transparent transactions. This article explores the potential of utilizing technology to mitigate the issue of counterfeiting. The effectiveness of several blockchain technologies was assessed, along with anti-counterfeiting methods. This study posits three concepts that emphasize the necessity of factors outside technology in mitigating counterfeiting. Implementation of a robust alarm system, utilization of tamper-proof packaging, execution of awareness programs, and enforcement of legal measures are vital. The integration of blockchain technology has been suggested as a comprehensive approach for mitigating counterfeiting.

2. Overview of the Proposed System

2.1 Introduction and Related Concepts

The proposed system, which uses blockchain technology to identify bogus goods, offers a safe and trustworthy method of product verification. It uses blockchain technology to provide an unalterable and impenetrable record of a product's history of production, distribution, and origin. This system can assist companies and customers in identifying and stopping the sale of fake goods by utilizing this technology [15]. The product registration, product verification, and product tracking modules comprise the structure of the proposed system. Manufacturers can register their products on the blockchain network using the product registration module and assign a unique digital identity to each product. With the help of the seller module, sellers may acquire goods from producers and list them for sale in the blockchain network. Consumers can use the product verification module to check a product's blockchain record and scan its QR code to verify authenticity before purchasing it from a seller. Businesses can follow the path of their items through the supply chain and identify instances of fake goods using the product-tracking module. The architecture of the proposed system is user-friendly, safe, and scalable to ensure that both enterprises and consumers can quickly embrace it. The operation of the system depends on related ideas such as distributed ledger technology, encryption, and smart contracts. In a blockchain network, smart contracts are self-executing programs that make it easier for transactions to be verified and carried out automatically. Although distributed ledger technology enables multiple parties to access and instantly verify the same data, cryptography is used to ensure data privacy and integrity [16].

2.2 Framework, Architecture or Module for the Proposed System

A framework is a collection of rules, resources, and elements that serves as the basis for the creation of a blockchain-based fake product identification system. It contains several technical and architectural standards that outline the composition, features, and relationships of the system with other parts [18]. A Blockchain-Based Fake Product Identification System framework must be created to guarantee the effectiveness, dependability, and security of the system. Additionally, it must make it possible to integrate different elements, such as blockchain networks, smart contracts, and user interfaces. To ensure that the system is created to meet the necessary standards and is secure, the framework should also provide instructions for the development process, such as coding standards and testing techniques [17]. Overall, a well-designed framework can significantly reduce the development time and cost of a system while ensuring its functionality and security. The proposed system was created using a multilayered multi-module architecture. A blockchain network that stores and validates product information, a back-end database that keeps track of product transactions, and a front-end web interface that lets users engage with the system constitute the architecture [19].

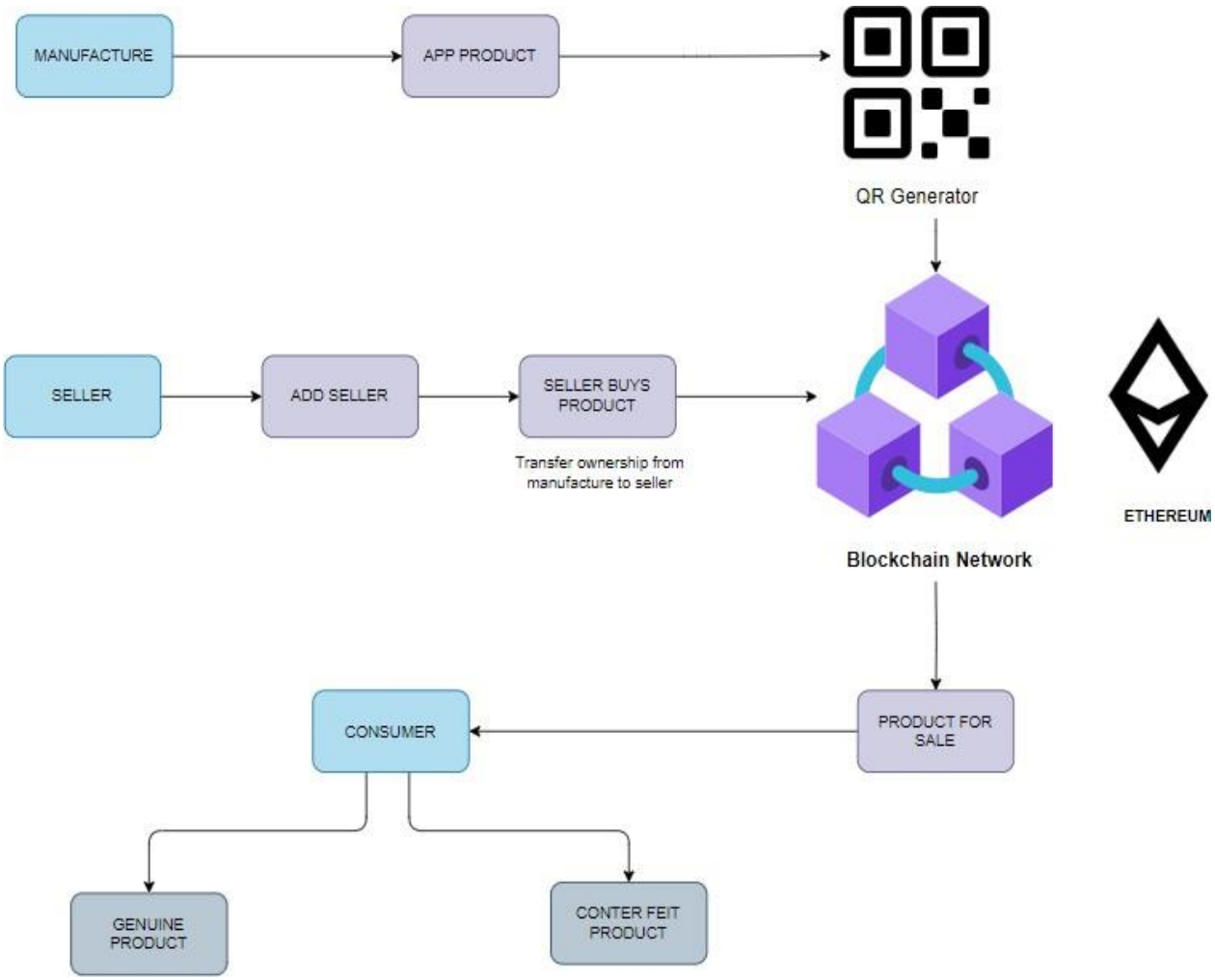

Fig. 1. Architecture diagram of blockchain-based fake product identification system

2.3 Proposed System Model

The proposed system model for blockchain-based fake product identification can be represented using an entity-relationship (ER) diagram or a Unified Modeling Language (UML) diagram, as shown in Figures [1] and [2].

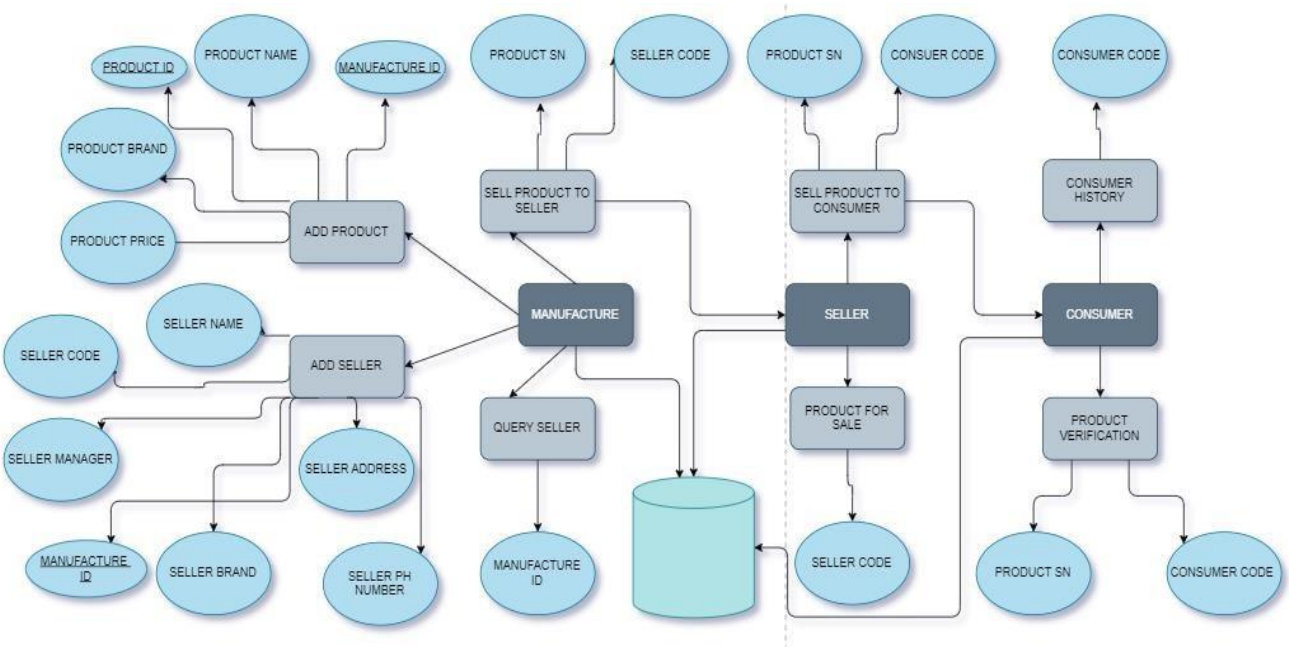

Fig. 2. ER diagram for blockchain-based fake production identification.

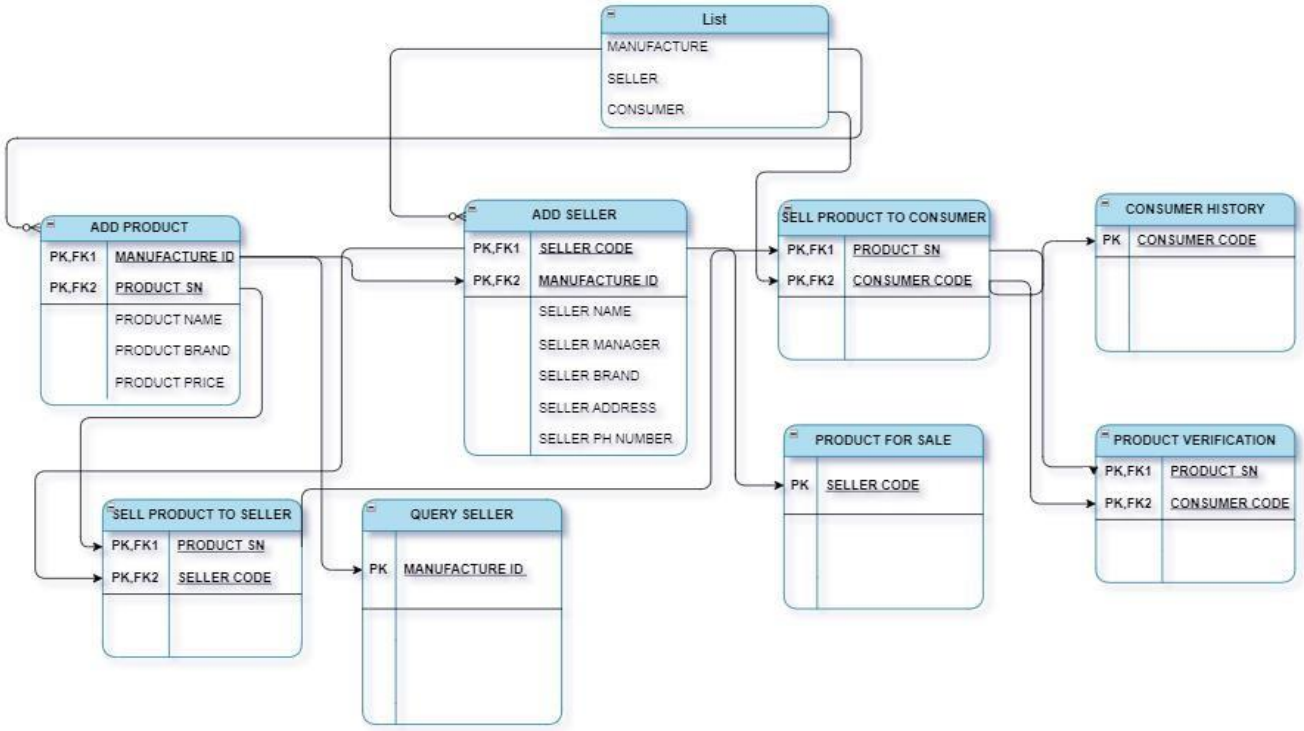

Fig. 3. UML diagram representing relationships.

The entities, characteristics, and relationships present in the system are shown in Figure 3. Products, producers, distributors, retailers, and customers are among the entities in this system. Product ID, Product Name, Manufacturer Name, Distributor Name, Retailer Name, and Consumer Name are among the properties connected to these entities. Manufacturers and goods have a manufacturing relationship, distributors and products have a distribution relationship, and retailers and customers have a buying relationship. Overall, the proposed system model using either an ER diagram or a UML diagram provides a visual representation of the system's entities, attributes, and relationships, making it easier to understand and implement [20].

3. Appendix

Appendix A- Counterfeit Trade: A Multi-Billion Dollar Global Challenge

Fig. 4. Trends in trade in counterfeit and pirated goods

Illicit trade in counterfeit goods, encompassing products such as shoes, clothing, electronics, and accessories, has thrived despite its illegality, recording a staggering $449 billion in transactions in 2019, as revealed by the OECD and EUIPO's Global Trade in Fakes report. These values taken from Figure 4 are comparable to the GDP of mid- sized European nations, such as Ireland ($431 billion) and Portugal ($372 billion), illustrating the lucrative nature of this shadow market. The major players in this trade are China and Hong Kong, accounting for nearly 80 percent of the volume and approximately 90 percent of the total value of counterfeit transactions from 2017 to 2019. This lucrative market, constituting 2.5 percent of global trade and around six percent of EU imports in 2019, was impacted by the COVID-19 pandemic, with border closures and limited production capacities leading to an upsurge in counterfeit pharmaceuticals and protective equipment [21].

Appendix B- The Menace of Counterfeit Drugs: Safeguarding Health and the Pharmaceutical Industry

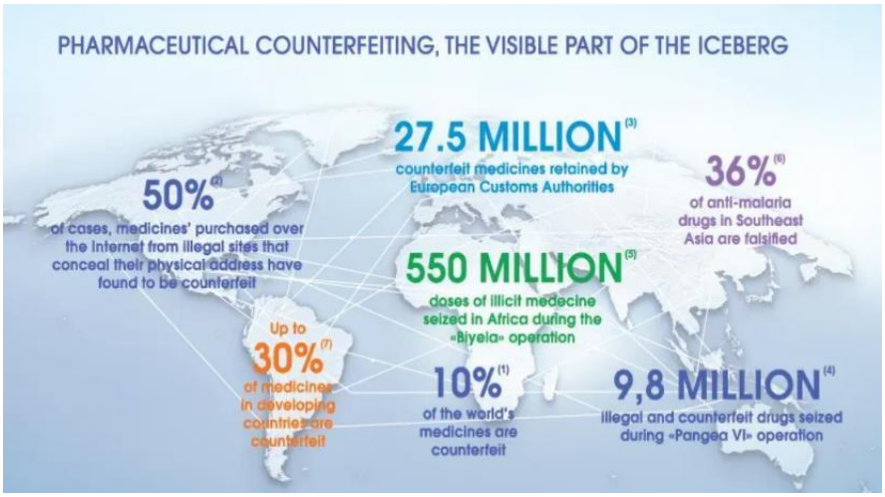

Fig. 5. Pharmaceutical counterfeiting

Counterfeit drugs are a widespread issue that can have negative health effects and damage the pharmaceutical industry's reputation. With nearly a third of antimalarial medications in sub-Saharan Africa being fraudulent, the WHO estimates that bogus antimalarial treatments alone result in more than 120,000 fatalities in Africa each year. Referring to the data and values from Figure 5, it is estimated that counterfeit drugs cost UK firms £36.9 billion a year and US companies over $200 billion, costing more than 750,000 jobs. To address this issue, pharmaceutical businesses must enhance their data-management procedures [22].

Appendix C- Piracy and Counterfeiting on the Rise: A Growing Menace

Fig. 6. Global trade volume with counterfeit goods in 2019.

According to a Global Trade in Fakes study from the OECD and EUIPO, trade in counterfeit products reached approximately $449 billion in 2019, equivalent to the GDP of a mid-sized European nation, as shown in Figure 6. Additionally, this market is comparable to Hong Kong's GDP, which accounted for 20% of the value of goods confiscated between 2017 and 2019. In 2019, fake trade accounted for 6% of imports into the European Union and 2.5% of global commerce [3, 23].

4. Results and Discussion

The utilization of blockchain technology for the identification of counterfeit items presents several possible benefits. One of its most significant advantages is its potential to deliver an immutable record of the creation and distribution history of a product. This record may be used to accurately demonstrate a product's reliability, ensuring that consumers receive what they have paid. Consequently, buyers are likely to exhibit greater trust in the firm and reduced apprehension over potential harm to the brand's reputation caused by counterfeit products. In addition to facilitating cost reduction in product verification and enhancing supply chain efficiency, blockchain-based solutions may address the concerns. There is a possibility that this initiative might enhance financial performance by reducing inventory holding costs and minimizing waste. The use of blockchain technology may make supply chains more transparent and auditable. This approach can be used to identify and address any ethical difficulties that can arise throughout a product's manufacturing and distribution, such as environmental concerns, labor violations, and other ethical dilemmas. The anticipated implementation of a blockchain-based system has the potential to provide customers with a safe avenue through which they may obtain authentic items. It is acknowledged that obstacles remain to be addressed prior to the global implementation of the system. Nonetheless, our dedication to identifying and executing resolutions is unwavering.

In Figure 7, we provide an illustration of the Ganache server, a development tool utilized for Ethereum blockchain applications. Installing the MetaMask browser plugin, which functions as a cryptocurrency wallet and enables users to safely store and transfer digital assets, manage Ethereum accounts, and communicate with decentralized applications (dApps), is possible for users who follow the instructions in Figure 8. Figure 9 presents a graphical depiction of the sequential stages involved in the procedure of incorporating products into the manufacturer's inventory. Figure 10 shows a graphical illustration of the successful addition of a product along with the subsequent generation of a unique QR code. The depicted step, as shown in Figure 11, pertains to the pivotal moment at which the QR code is uploaded and prepared for commercialization. The act of a consumer acquiring commodities or services from a seller. As depicted in Figure 12, this denotes the juncture at which the purchaser utilizes the QR code to acquire access to comprehensive information pertaining to the product and initiate the transaction for purchase in collaboration with the vendor. The authenticity of the product was confirmed by the outcome of the product verification procedure, as shown in Figure 13. The result of product verification shows that the item was found to be fraudulent, as illustrated in Figure 14.

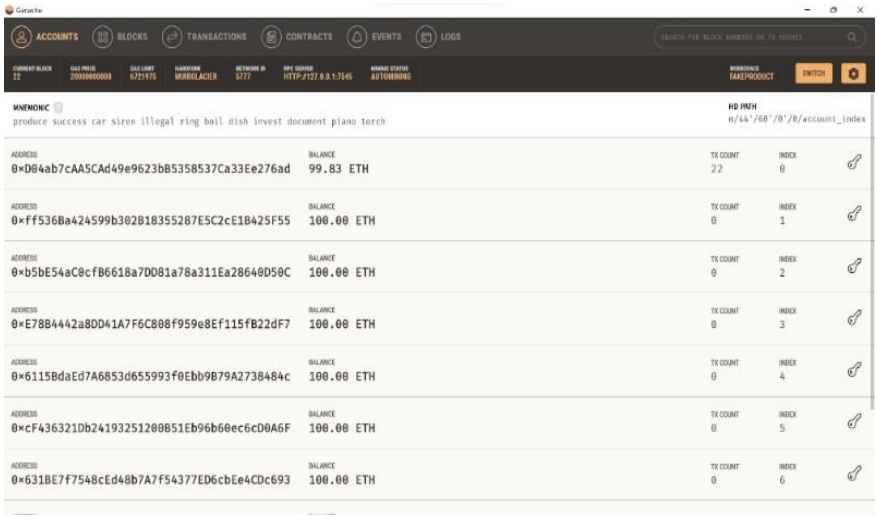

Fig. 7. Ganache server

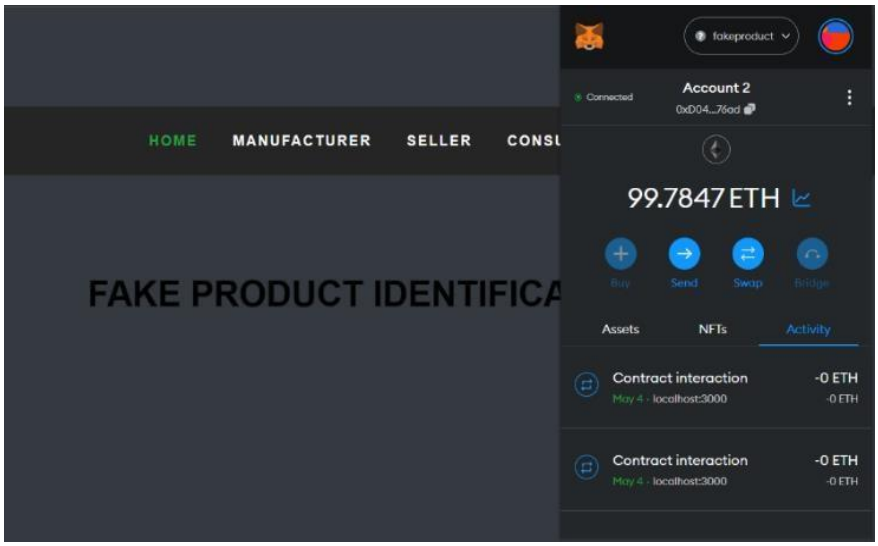

Fig. 8. MetaMask account

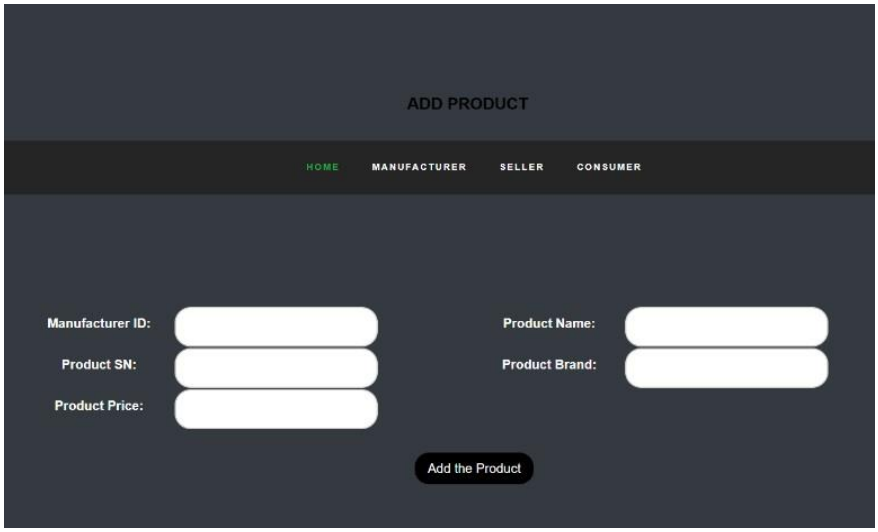

Fig. 9. Adding products to the manufacturer.

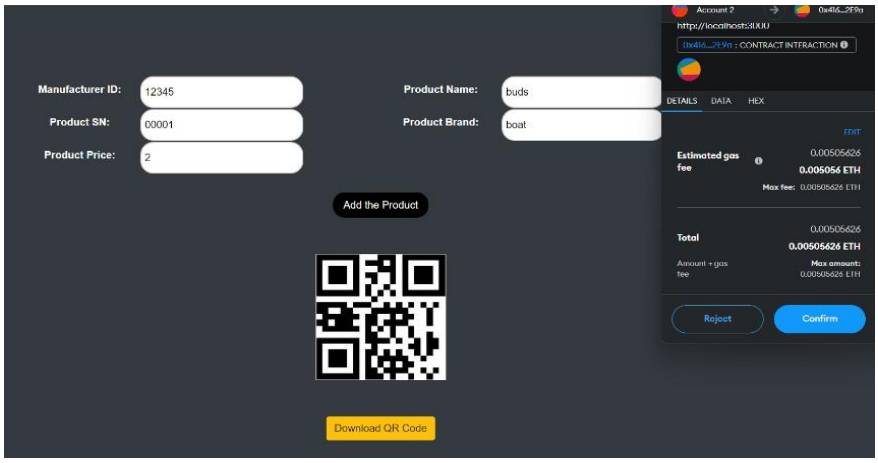

Fig. 10. successfully added a product and generated a unique QR code.

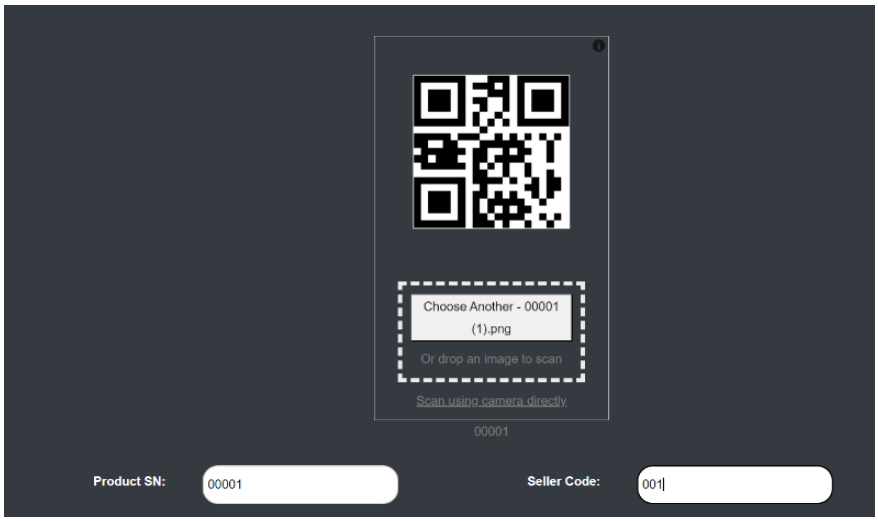

Fig. 11. The QR code was uploaded and ready to sell the product.

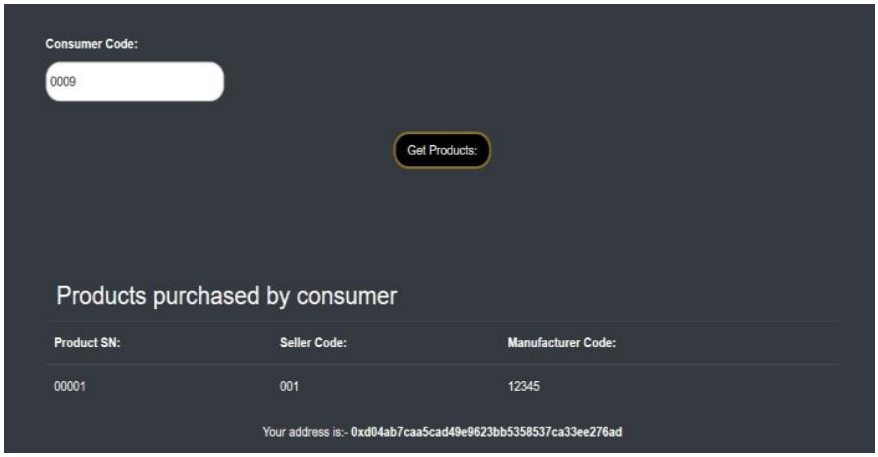

Fig. 12. Consumer purchase from the seller

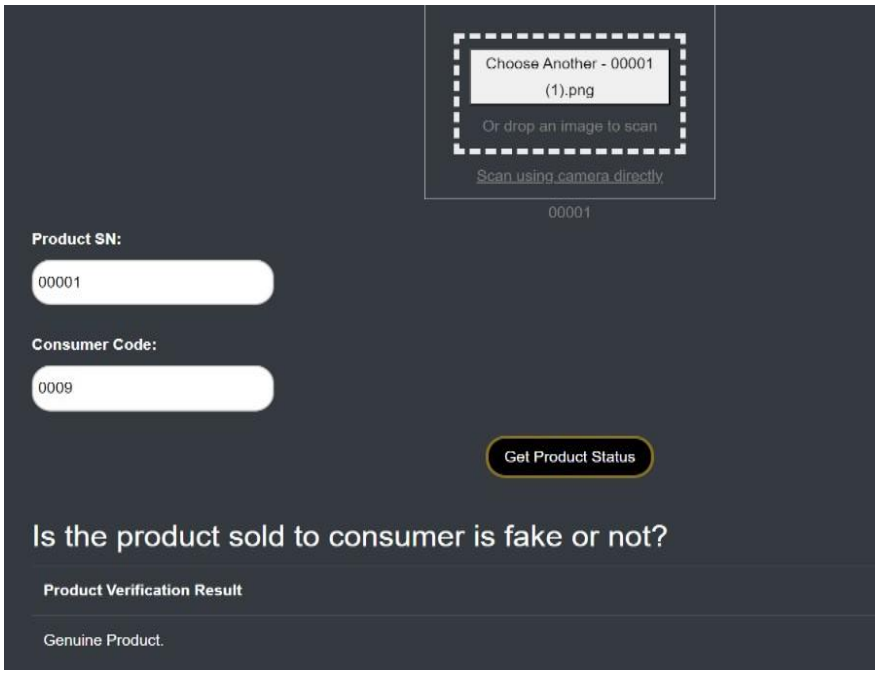

Fig. 13. Product verification results as Genuine Product

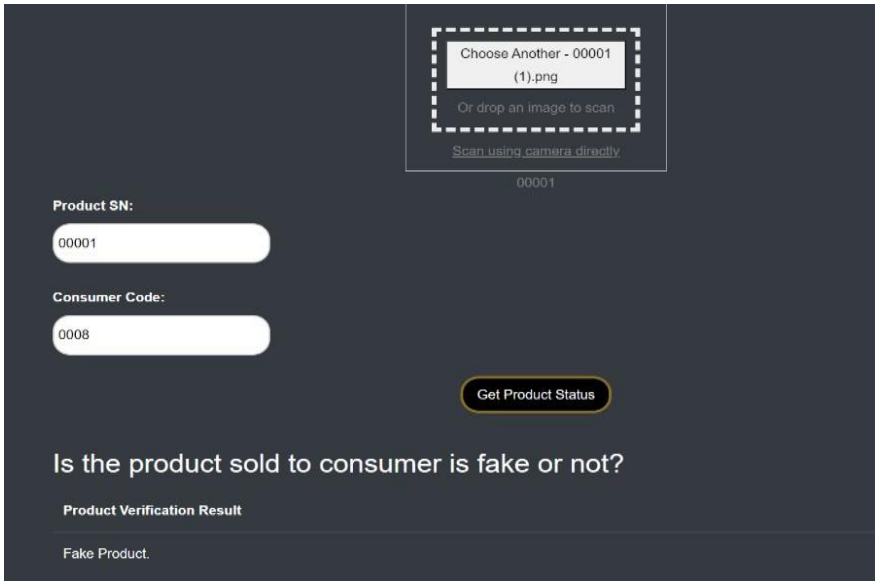

Fig. 14. Product verification results as Fake Product

5. Conclusion and Future Directions

Our research concludes by highlighting the revolutionary potential of decentralized blockchain networks in supply chain management and product authenticity verification. Our proposed method creates an indelible record of a product's journey from creation to sale, allowing various businesses to detect fake or counterfeit items. Our blockchain-based product registry contains origin, materials, and certifications. This register can be updated by producing or storing shipping nodes using smart contracts to identify phony items. These self-executing contracts verify the product's validity using set standards.

Making sure that different supply chain nodes integrated seamlessly into the blockchain-based product registry was one of the most significant hurdles we encountered. There were logistical and technological challenges in coordinating the involvement of producers, distributors, retailers, and other players. With unforgettable major challenges, securing data processing techniques and implementing strong validation processes were necessary to preserve the integrity of product information and avoid data manipulation.

By creating and evaluating our blockchain-based product registry, we have discovered significant challenges and possibilities to use blockchain technology for supply chain transparency and fake goods identification. This revolutionary technology may improve confidence, prevent copying, and ensure product transparency. Owing to its

decentralized nature and immutable record-keeping capability, our proposed blockchain solves the product's authenticity.

References

[1] Jambhulkar, S., Bhoyar, H., Dhore, S., Bidkar, A., & Desai, P. (2022). Blockchain Based Fake Product Identification System. *International Research Journal of Modernization in Engineering Technology and Science*, *4*(05).

[2] Dabbagh, Y., Khoja, R., AlZahrani, L., AlShowaier, G., & Nasser, N. (2022, March). A Blockchain-Based Fake Product Identification System. In *2022 5th Conference on Cloud and Internet of Things (CIoT)* (pp. 48-52). IEEE.

[3] Jadhav, R., Shaikh, A., Jawale, M. A., Pawar, A. B., & William, P. (2022, June). System for Identifying Fake Product using Blockchain Technology. In *2022 7th International Conference on Communication and Electronics Systems (ICCES)* (pp. 851-854). IEEE.

[4] Kumar, S., Gupta, V., Pachori, Y., Sharma, R., & Agarwal, A. (2021). Product Identification System Using Block chain. *International Journal of Scientific Research in Computer Science Engineering and Information Technology*.

[5] Dabbagh, Y., Khoja, R., AlZahrani, L., AlShowaier, G., & Nasser, N. (2022, March). A Blockchain-Based Fake Product Identification System. In *2022 5th Conference on Cloud and Internet of Things (CIoT)* (pp. 48-52). IEEE.

[6] Jadhav, R., Shaikh, A., Jawale, M. A., Pawar, A. B., & William, P. (2022, June). System for Identifying Fake Product using Blockchain Technology. In *2022 7th International Conference on Communication and Electronics Systems (ICCES)* (pp. 851-854). IEEE.

[7] Jadhav, R., Shaikh, A., Jawale, M. A., Pawar, A. B., & William, P. (2022, June). System for Identifying Fake Product using Blockchain Technology. In *2022 7th International Conference on Communication and Electronics Systems (ICCES)* (pp. 851-854). IEEE.

[8] Mhatre, M., Kashid, H., Jain, T., & Chavan, P. (2022). BCPIS: Blockchain-based counterfeit product identification system. *Journal of Applied Security Research*, 1-26.

[9] Shreekumar, T., Mittal, P., Sharma, S., Kamath, R. N., Rajesh, S., & Ganapathy, B. N. (2022). Fake Product Detection Using Blockchain Technology. *Journal of Algebraic Statistics*, *13*(3), 2815-2821.

[10] Wang, X., Xie, H., Ji, S., Liu, L., & Huang, D. (2023). Blockchain-based fake news traceability and verification mechanism. *Heliyon*.

[11] Tiwari, K., Patil, N., Gupta, A., Sabale, A., & Lomte, V. Fake Product Detection Using Blockchain Technology.

[12] Ibebuogu, C. C., & Nwankwo, C. G. Certificate Verification System Using Blockchain and QR Code Technologies.

[13] Singh, N. T., Sharma, V., Raizada, A., Sharma, S., & Pathak, N. (2023, January). Identification of Fake Products using Blockchain Technology. In *2023 5th International Conference on Smart Systems and Inventive Technology (ICSSIT)* (pp. 736-740). IEEE.

[14] Rathee, T., & Malik, M. Authentication of Product & Counterfeits Elimination Using Blockchain. *International Journal of Innovations in Engineering and Technology (IJIET)*, *10*.

[15] Agrawal, N., Kushwaha, H., Shetty, S., & Lobo, V. B. (2022, June). A System to Detect Fake Products using Blockchain Technology. In *2022 7th International Conference on Communication and Electronics Systems (ICCES)* (pp. 874-878). IEEE.

[16] Nila, U., & Vignesh, A. L. A. Block Chain In Fake Product Identification System Using Qrcode.

[17] Mhatre, M., Kashid, H., Jain, T., & Chavan, P. (2022). BCPIS: Blockchain-based counterfeit product identification system. *Journal of Applied Security Research*, 1-26.

[18] Shreekumar, T., Mittal, P., Sharma, S., Kamath, R. N., Rajesh, S., & Ganapathy, B. N. (2022). Fake Product Detection Using Blockchain Technology. *Journal of Algebraic Statistics*, *13*(3), 2815-2821.

[19] Lavanya, P. M., Ananthi, N., Kumaran, K., Abinaya, M., Kalaivani, B., Krithika, V., & Rahul, S. S. (2021, December). Fake Product Detection using Blockchain. In *2021 4th International Conference on Computing and Communications Technologies (ICCCT)* (pp. 133-137). IEEE.

[20] Singh, S., Choudhary, G., Shandilya, S. K., Sihag, V., & Choudhary, A. (2021). Counterfeited product identification in a supply chain using blockchain technology. *Research Briefs on Information and Communication Technology Evolution*, *7*, 20-34.

[21] Statista. (2023). Global Trade Volume with Counterfeit Goods Compared to GDP of Selected Countries/Regions [Online Chart].Available

[22] Stibo Systems. How Data Can Help Fight the Deadly Consequences of Counterfeit Pharmaceuticals [Blog Post].Available

[23] OECD. (2019, March 19). Trade in Fake Goods Is Now 3.3% of World Trade and Rising [Archived Web Page]. Available

Authors' Profiles

Dr. Kakelli Anil Kumar is a Senior Associate Professor at the School of Computer Science and Engineering, Vellore Institute of Technology (VIT), Vellore, TN, India. He earned his Ph.D. in Computer Science and Engineering from Jawaharlal Nehru Technological University (JNTUH) Hyderabad in 2017, graduated in 2009, and under-graduated in 2003 from the same university. He started his teaching career in 2004 and worked as an Assistant Professor, Associate Professor, and HOD in various reputed institutions in India. His current research includes Artificial intelligence, wireless sensor networks, the Internet of Things (IoT), Cybersecurity, Malware analysis, blockchain, and cryptocurrency. He has published over 50 research articles in reputed peer-reviewed international journals and conferences.

Suman Tandan was born June 6, 1999, in Chhatrakot-2, Gulmi, Nepal. He earned a B. Tech in Computer Science and Engineering from Vellore Institute of Technology in 2023. He majors in computer engineering. Suman Tandan's virtual internship at Microsoft Azure allowed her to get important professional experience. This experience let him explore clouds, security, and blockchain. He dedicates his present and past studies to cybersecurity. Suman Tandan is a software engineer. He was awarded a full scholarship for his B. Tech degree in honor of his exceptional academic achievement and contributions to the field. In his study and personal growth, Suman Tandan shows his enthusiasm for computer engineering.

Atul Koirala was born on October 25, 2000, in the Nepali capital of Kathmandu. He received a B. Tech in Computer Science and Engineering from Vellore Institute of Technology in 2023. He studied computer science and engineering and likes web development, cryptocurrency, and AI. Atul Koirala has a diverse career and valuable experience. Also worked as a software developer and cybersecurity analyst. His fellowships and summer internships showed his passion for computer science, engineering, and cybersecurity. Recent and former research interests include web development, artificial intelligence, cyber security, and data visualization, demonstrating his expertise.

How to cite this paper: Kakelli Anil Kumar, Suman Tandan, Atul Koirala, "A Fake Product Identification and Prevention System Using Blockchain Technology", International Journal of Education and Management Engineering (IJEME), Vol.14, No.6, pp. 20-31, 2024. DOI:10.5815/ijeme.2024.06.02