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Fake Product Identification System Using Blockchain

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Abstract: ***Counterfeits are some of the common issues facing this day's world market, from electronics to pharmaceuticals. Such Counterfeit products damage brands and pose a significant danger to consumer health as well. The traditional methods adopted for identifying counterfeit products are inefficient and prone to tampering. Blockchain technology promises an ideal solution for this challenge. With blockchain as decentralized, open, and tamper-proof technology, the supply chain will be traceable from where it originated to reach its final usage in the user's hands. For every single product, allocate a unique digital identity, so the journey the product has taken to reach the marketplace will be recorded in the blockchain; therefore, one can easily track the authenticity with the help of both consumers and businesses.***
In this review, we discuss the likelihood of blockchain technology being an avenue for identifying fake products, not only enhancing trust and transparency but also lowering the level of counterfeit goods in the market. Various Blockchain-based approaches have been discussed to reveal current challenges in implementation and potential future prospects for comprehensive adoption.
This technology can revolutionize the means by which industries combat counterfeiting, thereby ensuring a more reliable and safer marketplace for world consumers.
Keywords: Counterfeit (Fake) product, smart contracts, Blockchain, Ethereum, QR code, Transaction history.

I. INTRODUCTION

The production of counterfeit products has become a serious issue in today's market. This increase in counterfeit products not only poses a threat to the financial stability of companies but also seriously threatens the health and safety of consumers. The counterfeit products vary from luxury goods, electronics, pharmaceuticals, and even food items. The traditional methods for the detection of counterfeit products are security labels, holograms, and RFID tags, which have been proved to be. It is not effective enough because the counterfeiters have become sophisticated. Blockchain technology is an emerging one that can change the world in many sectors. The blockchain transparency and immutability make it ideal for since it is immutable and transparent, blockchain is a fantastic element to work with in building a counterfeit-detecting system. Blockchain technology has been applied to various applications. In terms of the application, supply chains, finance, and up to health fields vary. Its latest application in detecting counterfeit products is relatively a new application. We introduced a fake product in this paper detection system using blockchain technology. Our proposed system combines the transparency and the immutability of blockchain with the power of artificial intelligence and machine learning to detect forgeries. We test our proposed system by conducting experiments on a products images dataset.

II. LITERATURE SURVEY

1) "A blockchain based method for counterfeit product detection in supply chains "by H.M.Tharaka Thilina et al.(2021) In this paper, a blockchain based method for counterfeit product detection in supply chains the system uses a combination of bolckchain and internet of things(IOT) technology to track product throughout the supply chain, from the manufacturer to the end consumer. The authors demonstrate the feasibility of their approach through a case study of pharmaceutical supply chain.

2) "A secure blockchain based method for counterfeit product detection in online marketplace" by X. Zhang et.al.(2020) this paper proposed a secure blockchain based approach for detecting counterfeit products in online marketplace. The system usesa combination of blockchain and machine learning to analyse product description, images, and other data to identify potential counterfeit products. The authors prove the efficacy of their method using experiments on a real world product dataset.

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3) "Blockchain based anti-counterfeiting system for luxury products" by Y.Kimet AL.(2021) this paper proposed a blockchain based anti-counterfeiting system for luxury products. The system applies a hybrid of blockchain and near field communication(NFC) technology to follow products and eliminate counterfeits. The authors illustrate the feasibility of their methodology using a case study of a high-end handbag company.
4) "A blockchain based product authentication and anti-counterfeit system using QR codes" by H.Jin ET AL.(2020) this paper proposed a blockchain based product authentication and anti-counterfeit system using QR codes. The system uses a combination of a blockchain and QR codes to track products and prevent counterfeiting.The system employs a mix of blockchain and near field communication(NFC) technology to monitor products and avoid counterfeiting. The authors illustrate the viability of their method using a case study of a high end handbag producer.
5) "Blockchain enabled secure and efficient supply chain management: an empirical study " by W. Zhang ET AL.(2019) this paper proposed a blockchain enabled supply chain management system that can be used to detect and prevent counterfeit products. The authors illustrate the efficacy of their method using experiments on a real world product dataset.

III. BLOCKCHAIN

A block chain consists of collections blocks that is storage which includes data. Each one is timestamping its own along with all other data's transaction and Hash of own with hash previous. So difficult is it tampering with that. Blockchain Decentralized systems it ensures, that with any new entry on the chain. It may come as well through its nodes as its end; True version the single one so as to reach every node within the Block chain.

A. Working of Blockchain

A new sale is thus bear over the peer- to- peer network of computers around the globe.Computers on that network break equations vindicating that this is in fact a licit sale. These people are miners. They collect clusters of those into a block only when proved valid deals, it becomes their prize and an award is transferred their way, in a form known as a evidence of work. This chains those blocks together creating a long history of all deals that are endless. The sale is complete. Whole procedure is done as shown in Fig 1.

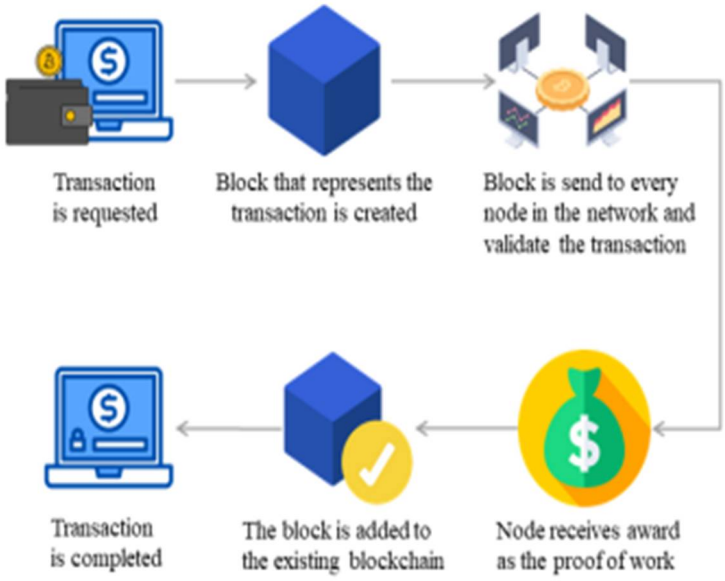

Fig. 1 Working of Blockchain

B. Blockchain Features

Blockchain can append data records to its database which does not depend on any central authority as an arbiter and works solely upon its consensus algorithms.Blockchain is an openly available database and is very reliable.The features of Blockchain are demonstrated in Fig 2.

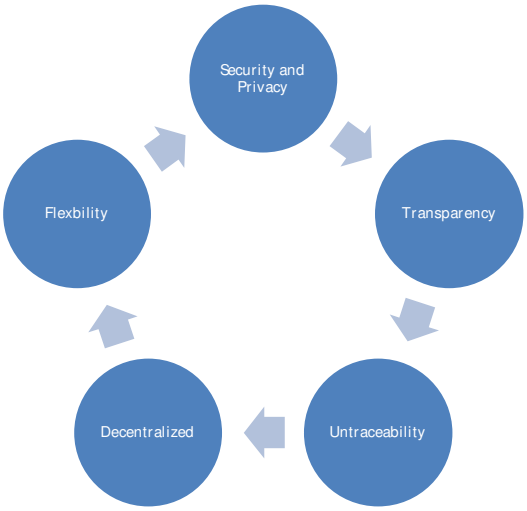

Fig. 2Features of Blockchain .

1) *Flexibility:* Flexibility in blockchain refers to its adaptability to different use cases, industries, and scenarios. Modern blockchain can be tailored to meet specific requirements, such as private networks for businesses or public decentralized networks for cryptocurrencies.
2) *Untraceability:* Untraceability refers to the ability of blockchain transactions to obscure the identities of parties involved or the details of transactions, enhancing privacy. While all transactions are recorded on the blockchain, the level of traceability depends on the design of the blockchain.
3) *Decentralization:* Eliminates the need for intermediaries like banks, brokers, or clearinghouses.Allows peer-to-peer transactions and operations without centralized control, reducing costs and increasing efficiency.Enhances trust, as no single entity controls the system.
4) *Transparency:* Transactions on the blockchain are recorded on a public ledger that is accessible to all participants.Immutable records ensure all data is consistent and traceable, promoting accountability.
5) *Security:* Cryptographic algorithm protects the data stored in blockchain, ensuring its integrity.Blocks of data are linked in a chain, and altering any record requires the consensus of the entire network, making fraud or tampering nearly impossible.

IV. METHODOLOGY

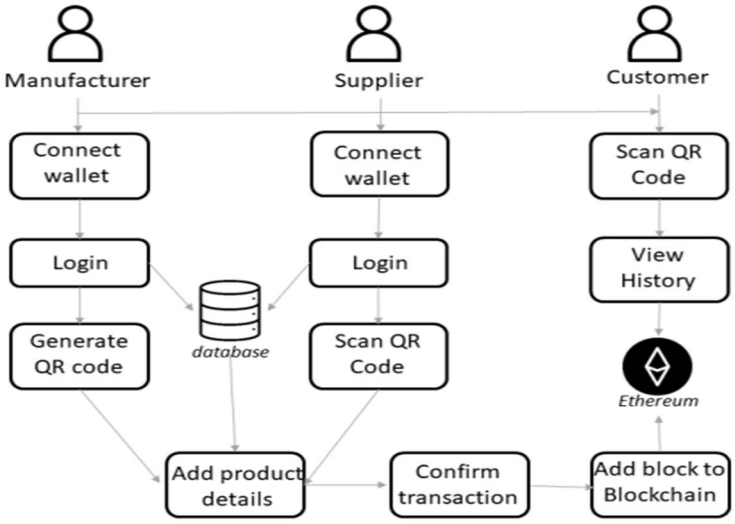

Fig. 3 System Architecture

Fig. 5 Original result

Fig. 6 Fake result

The first operation is the manufacturer- side operation in which we have to first register ourselves.After registration login into the operation, the manufacturer can add the product details.In this app, we have a QR law scanner which we can.The QR law of the product also indicates whether the product is fake or true.Another alternative is a blockchain displaying the name of the generated block product, the hash value produced, and if the product is corrupted .customer login in this design, in the operation.After logging in, he fills in the details to order the product and book the product.The product order can be shown to the manufacturer.The manufacturer decides whether the product request is respectable or not.After the manufacturer accepts the product order, it generates a unique QR law for the product.Once the product order is stored on the network, the hash law of that product is generated and the trade of the product can be maintained.The proposed system generates a QR law for a specific product.guests overlook the QR law on a product or package using the smartphones QR law florilegium operation, or the consumer operation has the option of a QR law scanner.After surveying, we get the product results true or fake.Initially, the blockchain system contains these product details along with the trade history to enable it to track the product along the distribution chain.All product details, block names, and hash values are stored in the firebase pall database.fake products are detected using a QR law scanner, where a QR law of the product is linked to a Blockchain.So, this system may be used to store product details and generated unique law of that product as blocks in the database.So, there is a strong need to descry fake products, and blockchain technology is used to descry fake products.likewise, the information is decrypted into a QR law.guests or stoners overlook the QR law and also they can descry the fake product.This real-time system can be executed to check whether the admit product is a fake product or an origin product.The manufacturer uses the SHA- 256 algorithm to induce a QR law in blockchain technology.T generated QR law is scanned by the user to check given product is fake or real.

Fig. 4 QR Code

1) Ethereum:

It is a decentralized blockchain that employs a proof-of-work consensus mechanism. Proof of work: it finds the block to add to the blockchain. That block to be added in the blockchain is performed by solving the mathematical expressions. This marks confirmation that the block is added and recorded in the blockchain. This process is called mining. Mining is basically brute force trial and error but successfully adding a block is rewarded in Ethereum, or ETH17, 19.

2) Smart contract:

Smart contracts are program which sit inside blocks. Smart contracts replace the function of third members. Such third members could also be termed protocols that function by the Satisfies all the conditions. They cannot be changed, so no party can change the contract.

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V. RESULT AND DISCUSSION

The project's results present the working system, as it implements the QR code to authenticate a product. Originality, if the scan QR code shows the details for the product which includes the description, product name, manufacturer name, company name, unique product id, and others then we can say that the product is genuine.If by scanning the product QR code if it does not showany details, then we say that the data for the product does not appear in the blockchain system and it has been forged. So, we can say that the product is counterfeit.

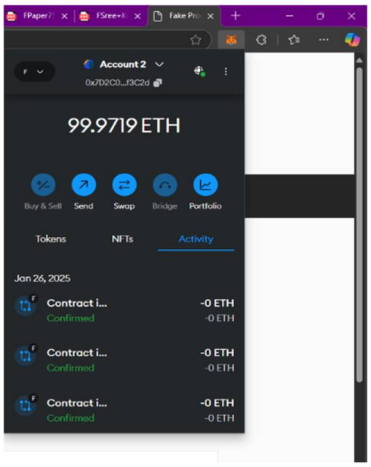

Fig. 7MetaMask

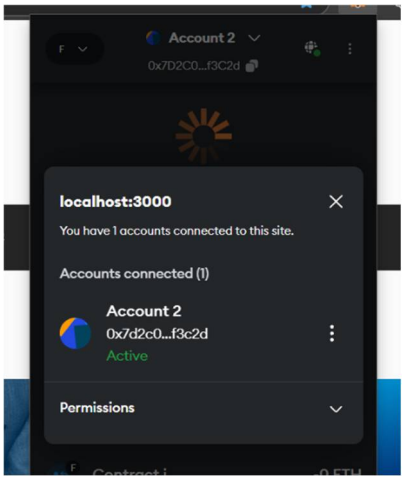

Fig. 8MetaMask Account

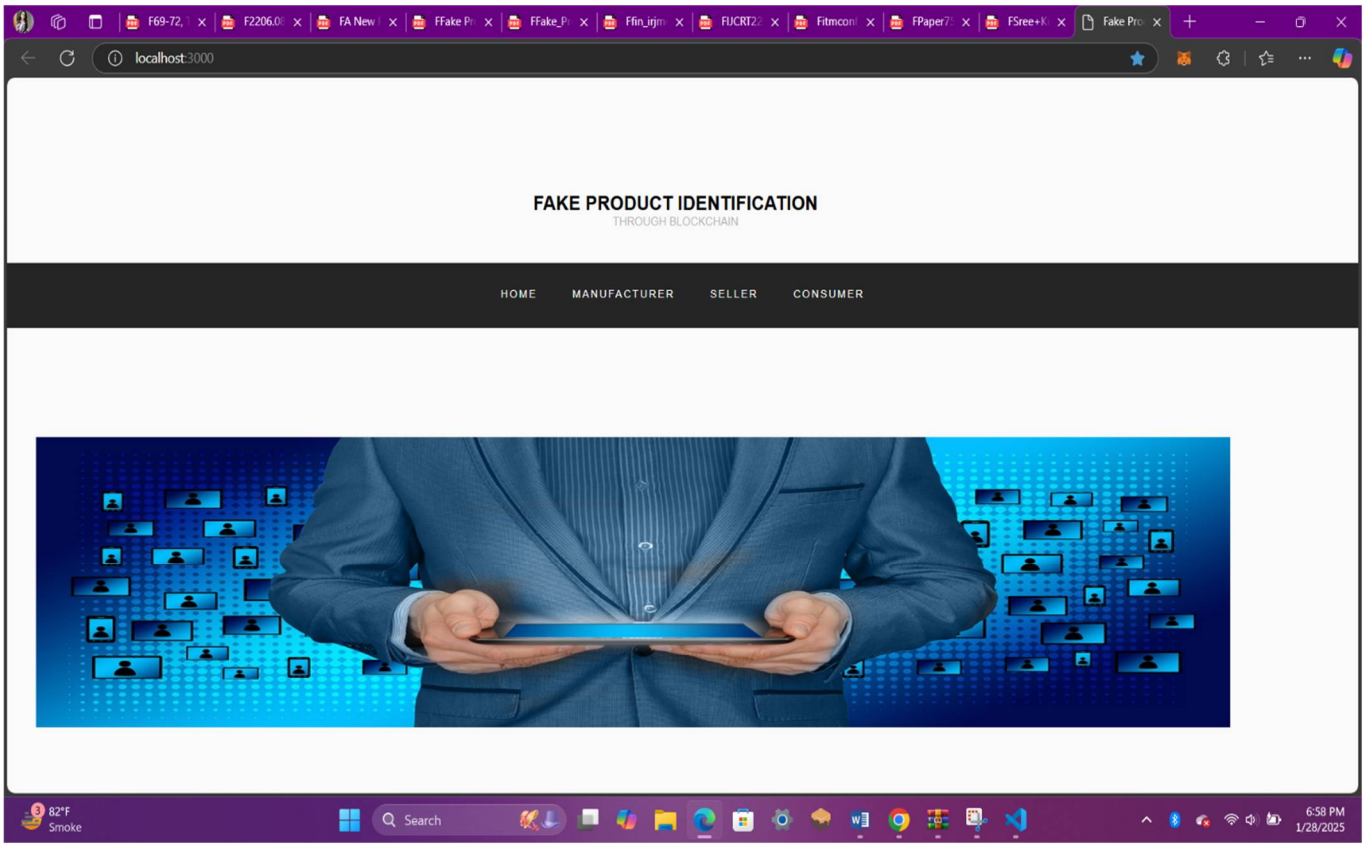

Fig . 9 Index Page

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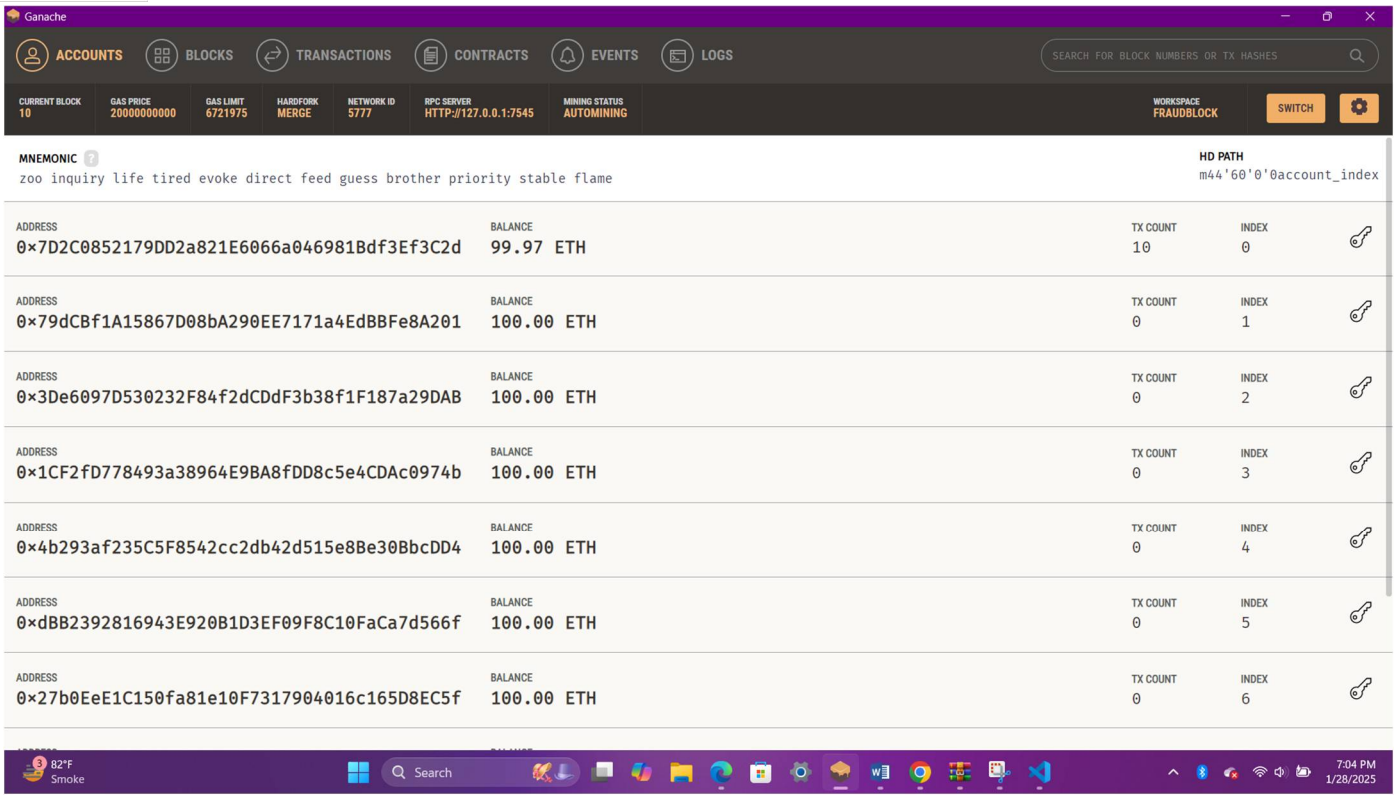

Fig. 10Ganache

VI. CONCLUSION

The adding number of products available online is the primary reasons why fake products are growing fleetly.thus, there's a strong need to find the fake product, and the blockchain technology is used to descry similar products.Alternate information is decoded in a QR law.later, druggies or guests overlook the QR law and they can find the fake product.In blockchain technology, digital information about the product can be stored in the form of blocks thus, in this paper we parried the system and the result to combat the malpractices of counterfeiting of the products, and suggested the system which is beneficial for end stoner to descry whether the product is fake or not by checking the throughout history of the product in force chain.End stoner can overlook QR law assigned this means that it can trace a product and can get all the information put up throughout theforce chain.Counterfeiting products is one of the long terms issued face in the request and needed an effective and safe system to identify and help the issue.This blockchain grounded discovery of fake product system offers tamper proofing with robotization as it detects and prevents the selling of fake products.The use of blockchain technology and the capacity of smart contracts give security in this system by automating through the invariability and safety offered by the technology.further these approaches needed exploration to determine their scalability and feasibility in the real world.

VII. ACKNOWLEDGMENT

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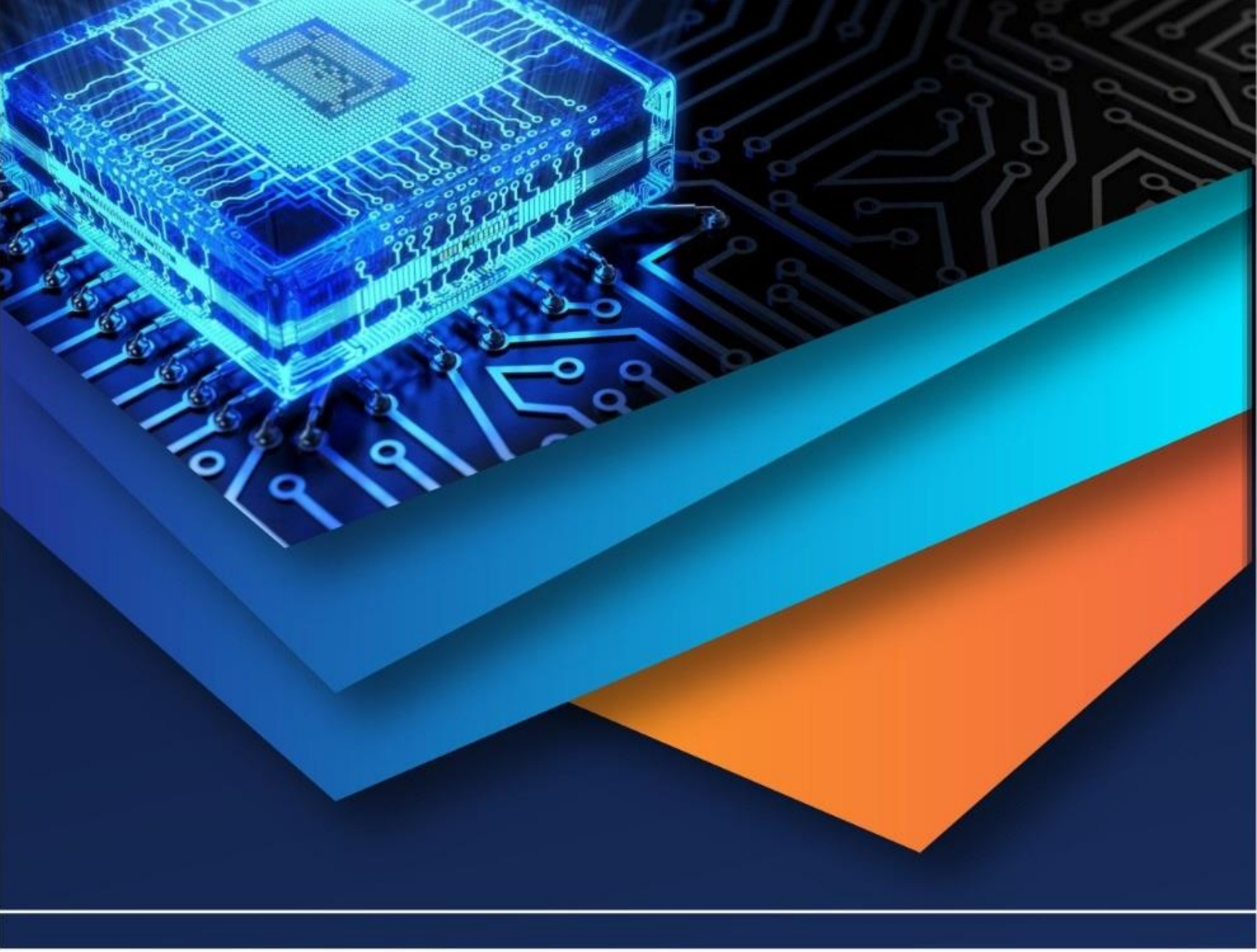

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