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### **Role of Blockchain Technology in Ensuring Authenticity of Products Sold Online**

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**ABSTRACT**

*This research paper clearly examines how blockchain technology helps in ensuring the authenticity of products sold online and addresses the main research problem that is the difficulty in verifying the authenticity of the products sold online. This issue arises due to the lack of transparency and reliability in traditional supply chains, as in this the product passes through various stages and at that time the information can be easily manipulated or may be incomplete.*

*Using a doctrinal and analytical approach, the study examines the relevant legal provisions, academic literature, and real-world examples of supply chain management which uses blockchain technology. The research highlights what blockchain technology is and how it strengthens the trust of the consumers in online transactions by ensuring secure, protected, transparent and incorruptible records. This technology allows continuous traceability of the products from their original source to the final consumer, which helps with authentication of products. In online markets, blockchain technology reduces the growing issue of counterfeit goods by ensuring traceability and transparency.<sup>1</sup> With better legal support and more adoption, it can ensure that the online products are genuine and build stronger trust among the buyers. However, certain challenges like higher costs, technical problems and unclear regulatory rules limit their growth and overall effectiveness.*

*According to the study, blockchain technology helps in ensuring the authenticity of online products with transparency and traceability but there are some challenges with that like higher costs, technical problems and unclear regulatory rules.*

**KEYWORDS**

*Blockchain technology, Counterfeit goods, Product authenticity, Traceability, E-Commerce.*

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<sup>1</sup> Prakyath, "Fake Product Identification Using Blockchain Technology" (accessed March 29, 2026) <https://www.ijraset.com/research-paper/fake-product-identification-using-blockchain-technology->

## INTRODUCTION

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E-commerce is rapidly expanding in today's modern world, which has transformed the way of buying and selling of products among people across the world. Nowadays online platforms have expanded the choice of consumers, improved convenience, and given new chances for the businesses to expand. But the rapid growth of e-commerce has led to a problem which is increased circulation of fake and counterfeit products. Due to this it has become difficult for the consumers to verify whether the online products are genuine or not.

In this context, blockchain technology, which is a distributed and immutable ledger that allows secure and transparent transactions without the need for intermediaries, offers a promising solution for detecting and preventing fake products.<sup>2</sup> Blockchain technology holds a significant place in terms of the authenticity of products but still it is in a developing stage. Existing research papers have mentioned blockchain technology and how it helps in identifying counterfeit goods, however, only little bit of attention has been paid to its practical implementation, legal challenges and the influence on consumer trust. Moreover, the lack of clear regulatory frameworks and the improper implementation of blockchain in e-commerce has widened the gap between theoretical knowledge and practical application in the online market.

The objective of this paper is to tell how blockchain technology helps to ensure the authenticity of online products. This paper will aim to:

- To examine how blockchain technology helps to ensure the authenticity of online products.
- To analyze how blockchain technology influences consumer's trust in online shopping.
- To study the influence of blockchain technology on transparency and traceability in supply chains
- To examine the challenges while implementing the blockchain technology in e-commerce

Based on these objectives of the research paper the study seeks to answer the following questions:

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<sup>2</sup> Mrs. Mrudula Gudadhe, Snehit Alchewar, "Unveiling Fakes: A Blockchain-Backed Approach for Product Authentication"11J. IJRASET.2(2023).

- How can blockchain technology help in ensuring the authenticity of products sold online?
- What are the benefits and limitations of blockchain technology in ensuring the authenticity of online products using blockchain technology?
- What are the challenges faced while implementing blockchain technology in e-commerce?
- What strategies can be adopted to overcome the barrier while adopting blockchain technology in e-commerce?

By analyzing the objectives and questions, this research aims to explore how blockchain ensures the authenticity of online products and enhances the trust of the consumers.

This paper provides a brief background and literature review, outlines the gaps, objectives, and questions. It discusses the role of blockchain in ensuring authenticity and ends up with key findings and conclusions.

## LITERATURE REVIEW

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The sudden increase of counterfeit products in the online marketplace is posing a serious challenge to authenticity of the product and consumer trust. For this growing concern blockchain emerged as a technological solution as it has features like decentralization, transparency and immutability. Specific existing research highlights how blockchain technology can redefine traditional product authentication mechanisms and enhance the trust of the consumers.

A scholarly study in this domain by Prakyath, Ashwin S (2025) titled as *“Fake Product Identification Using Blockchain Technology.”* The authors propose that blockchain systems frameworks use unique digital identifiers such as QR codes to verify product authenticity. Their research states that blockchain is an immutable ledger which ensures that once the information of the product is recorded it cannot be modified or tampered. This unique feature allows the consumers to verify the product's details in real time which reduces the dependency on central authority. Their study mentions that blockchain enhances transparency and strengthens the consumer trust by providing them with reliable and verifiable product details.

Another work by Mrs. Mruddula Gudadhe, Snehit Alchewar (2023) titled as “*Unveiling Fakes: A Blockchain-Backed Approach for Product Authentication*,” examines the limitations of traditional authentication systems. The authors propose a decentralized registry that is a blockchain system for maintaining product related data which improves traceability of the product across the supply chain. Their research emphasizes that any person involved in the product lifecycle from stakeholders to consumers can access accurate and transparent information regarding the product origin and its movement. This decentralized approach minimizes the risk of data manipulation and enhances the reliability of authentication systems in online marketplace.

A research paper by Anshul Singh (2025) titled as “*Chain Thread: Blockchain-Powered Product Verification and Authenticity Tracking*,” mentions an integrated system that combines blockchain with QR codes, NFC chips and RFID tags. The research highlights the importance of combining digital and physical verification mechanisms to create a good authentication system. The study mentions that such integration enables seamless and real-time verification which becomes very important in online markets where consumers cannot physically check the products. It also emphasizes the capability of blockchain to provide end-to-end traceability which ensures that each step of the product lifecycle is recorded and accessible by all those who are in that lifecycle.

A comprehensive perspective is provided by Mitra Madanchian in the article “*A Narrative Review and Gap Analysis of Blockchain for Transparency, Traceability, and Trust in Data-Driven Supply Chains*.” This article provides a broader analytical framework by critically examining how blockchain enhances supply chain transparency and the trust of the consumers. The study identifies the challenges such as scalability, interoperability and higher implementation cost. It highlights that blockchain has greater potential, but its adoption is still limited due to technical and organizational challenges.

Insights from the blog “*Challenges in the Adoption of Blockchain and How to Solve Them*” discusses addressing real-world implementation barriers. The blog outlines the major challenges such as higher implementation cost, unclear regulatory frameworks and lack of technical expertise. With that it also suggests practical solutions such as development of user-friendly interfaces, support by the government through clear regulatory frameworks, use of pilot projects and the collaboration across different industries. These insights bridge the gap between theoretical knowledge and real world and emphasizes that successful adoption

of blockchain technology requires technological advancement, industrial readiness and consumer awareness.

Overall, the existing literature states that blockchain technology plays an important role in ensuring the authenticity of the products sold online. It provides secure data storage, transparent supply chain tracking and consumer accessible authentication mechanism makes it a powerful tool to identify counterfeiting products in the online marketplace. With that the literature also mentions about the challenges associated with the implementation of blockchain technology, highlighting the need for practical solutions and some supportive regulatory frameworks.

## METHODOLOGY

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This research adopts a doctrinal and analytical approach to analyze the role of blockchain technology in ensuring the authenticity of online products. This research is completely based on secondary data which is collected through scholarly works such as research papers and articles and that specifically focuses on blockchain technology and the authentication of products.

The methodology primarily involves the structured review of the key research papers and journals including *“Fake Product Identification Using Blockchain Technology”* by Prakyath, Ashwin S (2025), *“Unveiling Fakes: A Blockchain-Backed Approach for Product Authentication”* by Mrs. Mrudula Gudadhe, Snehit Alchewar (2023), and *“Chain Thread: Blockchain-Powered Product Verification and Authenticity Tracking”* by Anshul Singh (2025), *“Fake Product Detection Using Blockchain”* by Hari Karthikeyan A (2024) and were studied because they directly stated the use of blockchain in identifying counterfeit products and ensuring the authenticity in online marketplace and also the challenges. This research paper also focuses on how the features of blockchain such as immutability, transparency and decentralization helps in creating secure and reliable product records. Additionally, the study also explores real-world examples to understand how blockchain based authentication systems are being used in the practical world.

The study also includes critical analysis to examine whether blockchain technology can be applied to e-commerce and focuses on the important challenges while implementing blockchain technology such as scalability, higher cost, and regulatory framework issues.

By examining these factors in depth, the research aims to bridge the gap of theoretical study and the practical implementation. To maintain the reliability of the research only relevant and recent academic sources are used which directly address blockchain technology and product authentication.

Overall, this methodology enables the evaluation of how blockchain technology can be used for the authenticity of the product and highlights the gap and challenges while implementing the blockchain technology.

## UNDERSTANDING BLOCKCHAIN TECHNOLOGY

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Blockchain technology is a decentralized and distributed ledger that allows for secure and transparent recording of transactions. At its core, blockchain is basically the collection of blocks that are linked together which store information and it is a decentralized system. It ensures that every new block added to the blockchain is the one and only true version that is agreed upon by all nodes in the blockchain. It refers to the collective maintenance of a technical solution that maintains a continuous record file as a reliable database through decentralization.<sup>3</sup>

## WORKING OF BLOCKCHAIN TECHNOLOGY

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It is a combination of cryptographic techniques, distributed network and algorithms to create a secure and tamper proof ledger of transactions.

Blockchain works in a simple manner:

- a) **Grouping of transactions:** All the transactions are grouped together and are added to a block, each block is assigned a cryptographic hash which links it to a previous block and a chain is formed.<sup>4</sup>
- b) **Verification of block:** The transaction in the blocks gets verified by the nodes of the networks using consensus algorithm and once the consensus is reached the block gets added to the chain. After the addition to the chain, it becomes immutable.<sup>5</sup>

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<sup>3</sup> Kunal Wasnik, Isha Sondawle, "Detection of Counterfeit Products using Blockchain",44. ITM Web Conferences. 2.(2022)

<sup>4</sup> Mrs. Mrudula Gudadhe, Snehit Alchewar, "Unveiling Fakes: A Blockchain-Backed Approach for Product Authentication"11J. IJRASET.3(2023).

<sup>5</sup> Ibid

- c) **Maintenance of the blockchain:** The distributed networks of nodes maintain the blockchain and each node has a copy of the entire chain.<sup>6</sup>
- d) **Securing the blockchain:** Cryptography secures each block and ensures that the data in the block cannot be tampered with or altered without detection. This protects the blockchain from hacking or from other forms of attack.<sup>7</sup>

## ROLE OF BLOCKCHAIN TECHNOLOGY

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The trend of counterfeit products in today's online marketplace is increasing day by day. Counterfeit products not only harm the reputation of the brands but also pose a significant threat to consumer trust. In such cases blockchain technology offers an impactful solution by providing trust, transparency and security across the entire product journey.

- a) **Complete Transparency Across the Supply Chain:** Traditional supply chains often have multiple intermediaries and limited visibility whereas blockchain provides end-to-end transparency of the product journey at every stage. Every person involved in this journey has access to the same verified information. This transparency enables anyone in the chain to verify the product's origin and movement and ensures that counterfeit or tampered products cannot go undetected.<sup>8</sup>
- b) **Immutable Product Records:** Every transaction or update regarding a product is permanently recorded in a blockchain. Once the information regarding the product at every stage is added, it cannot be altered or deleted. This immutability completely guarantees the product's authenticity because blockchain records a secure and unchangeable record of a product's lifecycle.<sup>9</sup>
- c) **NFTs for Product Authentication:** NFTs are non-fungible tokens which redefine the businesses to verify the authenticity and ownership of high value products. Each NFT is a unique digital certificate stored on the blockchain which makes it impossible to duplicate or forge. This provides a secure and transparent way to consumers for confirming the authenticity of the product and makes them confident for the online purchases. Warranties backed by blockchain could be

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<sup>6</sup> Ibid

<sup>7</sup> Ibid

<sup>8</sup> HariKarthikeyan A, Karhunesh A, "Fake Product Detection Using Blockchain"12. IJCRT.2(2024)

<sup>9</sup> HariKarthikeyan A, Karhunesh A, "Fake Product Detection Using Blockchain"12. IJCRT.2(2024)

paired with NFTs with products, which creates a verifiable ownership and warranty record.<sup>10</sup>

- d) **Use of Smart Tags:** The integration of blockchain technology equipped with QR codes, NFC chips and RFID tags allows the buyers with a simple scan to instantly verify the authenticity of the product by checking its origin and reviewing its entire journey.<sup>11</sup> This instant verification empowers the consumers to make good decisions, and it significantly reduces the risk of purchasing counterfeit goods.
- e) **Authentication through Smart Contracts:** Verification processes can also be done through using smart contracts. These contracts are self-executing agreements that ensure that the products meet the authenticity criteria, warranties and certificates before they reach the consumer.<sup>12</sup> This reduces delays, errors and manipulation with the product ensuring that only verified products are sold.
- f) **Preventing Fraud and Counterfeiting:** In online marketplace, counterfeit products are increasing day by day which causes reputational harm to the brands and breaks consumer's trust. Decentralization and tamper proof architecture of the blockchain play an important role in combating fraud. If any attempt is made to manipulate the product records, then it will be immediately visible to all the network participants, which makes counterfeiting extremely difficult. That's how blockchain acts as a preventive mechanism for the products.<sup>13</sup>

## CHALLENGES WHILE IMPLEMENTING BLOCKCHAIN

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Blockchain holds immense potential to secure the authenticity of online products, but its practical implementation comes with several challenges.

- a) **Higher cost of implementation and maintenance:** Blockchain authentication system involves substantial investment. Deploying blockchain software, integrating devices such as smart tags, implementing tracking software and training personnel requires a lot of money. These expenses can be prohibitive in case of small and medium-sized

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<sup>10</sup>Annie Laukaitis "Blockchain in Ecommerce: Transforming Digital Transparency and Security", (accessed March 29, 2026) <https://www.bigcommerce.com/articles/ecommerce/blockchain-ecommerce/>

<sup>11</sup> HariKarthikeyan A, Karhunes A, "Fake Product Detection Using Blockchain"<sup>12</sup>. IJCRT.2(2024)

<sup>12</sup> HariKarthikeyan A, Karhunes A, "Fake Product Detection Using Blockchain"<sup>12</sup>. IJCRT.3(2024)

<sup>13</sup> Abhay Chopde, "A New Epoch in Product Assurance: Leveraging Blockchain for Robust Anti-Counterfeiting Measures"<sup>11</sup>.JETIR.7(2024)

enterprises which slow down implantation. Due to the higher cost, it becomes difficult for the implantation of blockchain.<sup>14</sup>

- b) **Scalability and Speed issue:** Blockchain networks face difficulties while handling large volumes of transactions. Millions of information related to products move simultaneously in a blockchain and recording each transaction in the blockchain creates hurdles due to which blockchain networks may encounter scalability issues, reduce the speed and limit the ability for instant verification.<sup>15</sup>
- c) **Consumer Awareness and Accessibility:** Consumers must engage with verification tools such as scanning QR codes, NFC tags and RFID tags for the authentication of products. Lack of awareness and technical barriers can reduce the practical benefits of blockchain and have an impact on product authenticity.
- d) **Legal and Regulatory Challenges:** The legal and regulatory frameworks around blockchain are still evolving. Issues such as cross border compliance, data privacy create uncertainty for businesses for adopting blockchain technology.
- e) **Interoperability Between Systems:** Different companies use different blockchain solutions which create problems while communicating with each other. Without standardization protocols, interoperability issues can reduce efficiency and reliability of blockchain in ensuring product authentication.<sup>16</sup>

## RESEARCH GAPS AND FUTURE DIRECTIONS

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While blockchain is emerging as a promising tool for verifying the authenticity of online products, existing academic literature reveals significant gaps which require further exploration. One of the key concerns is the lack of a clear and unified approach. Different studies and industries are experimenting with their own versions of blockchain systems, and such variability hinders cross study comparison as well as the conduct of policy

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<sup>14</sup> Md Habibur Rahman, "The advantages and challenges with the usages of blockchain technology in management information systems, particularly in us e- commerce enterprises" (accessed March 29,2026) [https://www.researchgate.net/publication/386276805\\_The\\_advantages\\_and\\_challenges\\_with\\_the\\_usages\\_of\\_blockchain\\_technology\\_in\\_management\\_information\\_systems\\_particularly\\_in\\_us\\_e-commerce\\_enterprises](https://www.researchgate.net/publication/386276805_The_advantages_and_challenges_with_the_usages_of_blockchain_technology_in_management_information_systems_particularly_in_us_e-commerce_enterprises)

<sup>15</sup> Adedamola Sobowale, Richard Okon "Ensuring product authenticity and traceability with blockchain in supply chains",24. WJARR.11(2024)

<sup>16</sup> Adedamola Sobowale, Richard Okon "Ensuring product authenticity and traceability with blockchain in supply chains",24. WJARR.12(2024)

benchmarking. Future research should be directed towards developing uniform frameworks and scalable metrics across industries.

Another gap which occurs is the implementation of blockchain technology, even though it presents theoretical advantages but its implementation in the real world is still in the experimental stage. Many small and mid-sized industries find it difficult to implement it due to higher cost, technical expertise and uncertainty about the results. These challenges are just mentioned on paper but never explored in enough depth.<sup>17</sup>

Another issue is related to the data itself. Blockchain can protect the data from being changed but it cannot guarantee that what has been entered is true and accurate and this creates a concern that if the data is flawed then the entire system is less reliable.

Legal and regulatory frameworks also create challenges. Different countries have different rules and regulations which create confusion and slow down its adoption. This builds a gap between the consumers and businesses and hinders confidence.<sup>18</sup>

Lastly there is a lack of long-term and wide range of studies. Existing studies only focus on short term outcomes and on specific industries making a gap in understanding how blockchain performs across different sectors.<sup>19</sup>

## STRATEGIES TO OVERCOME BLOCKCHAIN ADOPTION BARRIERS

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Adoption of blockchain in e-commerce offers great benefits for the authentication of products but several barriers such as technical, organizational and regulatory must need to be addressed. To overcome these barriers these strategies can help:

- a) **Enhancing Scalability and Performance:** This is one of the biggest barriers for the blockchain. To overcome this use a lightning network which involves adding a second layer to the main blockchain for speedier transactions. Organizations can adopt hybrid blockchain models which combine the security and transparency of public blockchains with private blockchains to balance efficiency and decentralization.<sup>20</sup>

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<sup>17</sup> Adedamola Sobowale, “Ensuring product authenticity and traceability with blockchain in supply chains” (accessed March 29,2026)

[https://wjarr.com/sites/default/files/fulltext\\_pdf/WJARR-2024-3413.pdf](https://wjarr.com/sites/default/files/fulltext_pdf/WJARR-2024-3413.pdf)

<sup>18</sup> Adedamola Sobowale, “Ensuring product authenticity and traceability with blockchain in supply chains” (accessed March 29,2026) [https://wjarr.com/sites/default/files/fulltext\\_pdf/WJARR-2024-3413.pdf](https://wjarr.com/sites/default/files/fulltext_pdf/WJARR-2024-3413.pdf)

<sup>19</sup> “A Narrative Review and Gap Analysis of Blockchain for Transparency, Traceability, and Trust in Data-Driven Supply Chains” (accessed March 29,2026)

<https://www.mdpi.com/2076-3417/15/17/9571>

<sup>20</sup> “Challenges in The Adoption of Blockchain and How to Solve Them” (accessed on 28 March,2026) <https://glair.ai/post/challenges-in-the-adoption-of-blockchain-and-how-to-solve-them>

- b) **Improving Interoperability:** Develop and adopt standardized protocols across different industries which could help businesses in collaborating on application development, validating proofs and sharing blockchain solutions. There are several projects which enable interoperability between different blockchain networks such as Ark which claims to provide universal interoperability and cross blockchain communication and transfers.<sup>21</sup>
- c) **Increasing Consumer Trust and Awareness:** The benefits of the blockchain must be communicated to the consumers in a simple and relatable way to understand the importance of it in the online marketplace. Organizations should explain how blockchain ensures authenticity of the product by creating secure and tamper proof records of a products journey which reduces the risk of counterfeit products. By explaining the advantages like safer transactions, increased transparency and protection against counterfeit goods can help the organizations to make blockchain more approachable and will encourage users to feel confident while purchasing online products.
- d) **Reducing Implementation Cost:** Higher implementation cost can become a challenge for the businesses to adopt blockchain technology, but this can be managed efficiently. Organizations can start with small pilot projects to check the feasibility before implementing the full-scale system. Businesses should use Blockchain-as-a-Service (BaaS) offered by Amazon web services or Microsoft Azure which helps in the reduction of heavy infrastructure investment.<sup>22</sup>

The strategies for overcoming the barriers while adopting blockchain for ensuring product authenticity lie in creating a transparent, tamper-proof and easily verifiable ecosystem.

## DISCUSSION

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The analysis of this research establishes that blockchain is a decentralized and immutable ledger which helps in ensuring the authenticity of the online products. It enables the creation of secure, tamper-proof and transparent ledger which strengthens the reliability of the product

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<sup>21</sup> “Challenges in The Adoption of Blockchain and How to Solve Them” (accessed on 28 March,2026) <https://glair.ai/post/challenges-in-the-adoption-of-blockchain-and-how-to-solve-them>

<sup>22</sup> Marisa Brown, Mark Melchionna, “7 challenges with blockchain adoption and how to avoid them” (accessed on 28 March,2026) <https://www.techtarget.com/searchcio/tip/5-challenges-with-blockchain-adoption-and-how-to-avoid-them>

authentication system. The study mentions the concept of immutability which means that the transaction recorded across the product lifecycle becomes permanent and unalterable. This ensures that there must be only a single verifiable source for checking the authenticity which minimizes the scope of counterfeit products.

Another major insight from the research is the end-to-end supply chain visibility. Unlike traditional systems that have limited traceability, blockchain provides a unified platform where all the people involved in a product's lifecycle can operate and share verified data. This continuous tracking mechanism enhances accountability and allows early detection of counterfeit products, thereby safeguarding both businesses and consumers. By using smart technologies such as QR codes, NFC chips and RFID tags which maintain transparency empowers the consumers with instant and accessible product verification tools.<sup>23</sup>

The research also mentioned the relevance of smart contracts and NFTs in strengthening authentication frameworks. Smart contracts set predefined conditions which ensure that only compliant and verified products enter the marketplace. Additionally, NFTs function as unique digital certificates for ownership and authenticity, especially for the high value products. Both contribute to building a more efficient and trustable e-commerce chain.

Despite the advantages, there are several implementation challenges that hinder the adoption of the blockchain. High investment cost and technical expertise become a barrier for the small and medium-sized industries and concern related to scalability and speed transactions limits the blockchain ability to handle the vast data. The data integrity at the input stage is also a concern as we know blockchain ensures that stored data remains immutable, but it cannot verify the accuracy of the data entered. This issue poses a gap to the overall effectiveness of the system.

To address these challenges the research also proposes several strategic solutions. Scalability can be enhanced through hybrid blockchain models and layer two solutions improve the transaction speed and efficiency. Increasing consumer awareness through user friendly interfaces helps in building trust among consumers. Through pilot projects Blockchain-as-a Service (BaaS) reduces the implementation cost which makes the blockchain technology more accessible to businesses.<sup>24</sup>

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<sup>23</sup> HariKarthikeyan A, Karhunesh A, "Fake Product Detection Using Blockchain"12. IJCRT.2(2024)

<sup>24</sup> Marisa Brown, Mark Melchionna, "7 challenges with blockchain adoption and how to avoid them" (accessed 30 March,2026)  
<https://www.techtarget.com/searchcio/tip/5-challenges-with-blockchain-adoption-and-how-to-avoid-them>

In conclusion, the research suggests that while blockchain technology offers a powerful and reliable framework for the product authenticity, its successful implementation depends on strategic efforts focused on scalability, cost optimization and regulatory frameworks.

## CONCLUSION

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To conclude, there is a significant shift from traditional verification systems to blockchain technology for ensuring the authenticity of online products which presents a secure and trust oriented digital framework. In this globalization era where e-commerce is rapidly expanding, the challenge of counterfeit products is becoming complex and demands innovative and reliable solutions. Blockchain technology with decentralized structure and cryptographic security offers a solution to address this concern and states how trust is established in online marketplaces.

Unlike traditional methods which rely heavily on intermediaries, blockchain introduces a unified and transparent system which records each transaction of the product lifecycle that is shared across a distributed network. This enhances accountability and empowers both consumers and businesses with verifiable information about product origin and its movement. And because of this the counterfeit product can be easily identified.<sup>25</sup>

At the same time, the effectiveness of the blockchain in ensuring product authenticity depends on its widespread adoption and practical implementation. Without proper data input, awareness among people and system integration of blockchain technology it may fall short of its intended purpose.

Despite several challenges such as cost, scalability, consumer trust and unclear regulatory frameworks, blockchain still has potential to reshape how the product authenticity is established in the online marketplace. With the right strategies and collaborative efforts of industries these barriers can be overcome. Governments and regulatory bodies can strengthen this system by recognizing blockchain records as valid proof for authenticity of products by initiating standardized across different industries.

Ultimately, blockchain technology redefines the future of online marketplace by including authenticity directly into the product journey itself. It creates a system where counterfeit

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<sup>25</sup> Adedamola Sobowale, "Ensuring product authenticity and traceability with blockchain in supply chains" (accessed 30 March,2026) [https://wjarr.com/sites/default/files/fulltext\\_pdf/WJARR-2024-3413.pdf](https://wjarr.com/sites/default/files/fulltext_pdf/WJARR-2024-3413.pdf)

products can be easily identified, and this strengthens the trust of the consumers. Blockchain has the potential to become the backbone of a secure, transparent and authentic marketplace. In the end, blockchain can enable seamless global trade by reducing verification complexities and allowing consumers to trace genuine products. In essence, blockchain not only safeguards authenticity but also proposes a way for a more transparent and secure online marketplace.