

THE FUTURE OF ONLINE SHOPPING: BUILDING A SECURE AND EFFICIENT E- COMMERCE PLATFORM WITH BLOCKCHAIN

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Abstract

This paper explores the potential of blockchain technology in building a secure and efficient e-commerce platform. With the increasing popularity of online shopping, the need for secure and efficient platforms has become more important than ever. Blockchain is a decentralized, immutable ledger that ensures security, transparency, and efficiency in transactions. In this paper, we provide an overview of the current state of e-commerce and the challenges faced in ensuring security and efficiency. We then discuss the basics of blockchain technology and its potential to address these challenges. The benefits of using blockchain in e-commerce include increased security, reduced transaction costs, and faster transaction processing times. We present a framework for building a blockchain-based e-commerce platform, highlighting the key components required for secure and efficient transactions. These components include smart contracts, digital wallets, and identity management systems. We also discuss the potential challenges in implementing blockchain technology in e-commerce, such as scalability and interoperability. Finally, we conclude by highlighting the potential of blockchain technology in revolutionizing the e-commerce landscape and providing a secure and efficient platform for online shopping.

Keywords: Online e-commerce application, Blockchain, Hashcode

I. INTRODUCTION

The rise of e-commerce has revolutionized the way people shop, enabling consumers to purchase goods and services from anywhere, at any time. However, the growth of e-commerce has also brought with it a range of challenges, including security and privacy concerns, slow transaction processing times, and high transaction costs. These issues have created a need for a more secure and efficient e-commerce platform. Blockchain technology, which is known for its decentralized and immutable nature, has the potential to address these challenges and transform the e-commerce landscape. Blockchain technology can provide secure, transparent, and efficient transactions, making it an ideal solution for e-commerce. This paper explores the potential of blockchain technology in building a secure and efficient e-commerce platform. It provides an overview of the current state of e-commerce, the challenges faced, and the potential benefits of using blockchain technology to address these challenges. It also presents a framework for building a blockchain-based e-commerce platform, highlighting the key components required for secure and efficient transactions. The potential challenges in implementing blockchain technology in e-commerce are also discussed, along with possible solutions. Overall, this paper aims to provide insights into the potential of blockchain technology in revolutionizing the e-commerce landscape and enabling the creation of a secure and efficient platform for online shopping.

II. LITERATURE SURVEY

According to Alex R. Mathew (2019), traditional data management systems have been found to be vulnerable to cyber-attacks due to their centralized nature. These systems rely on a single, independent security system, which makes them susceptible to Distributed Denial of Service attacks. In contrast, blockchain technology has the potential to improve the security of data storage due to its distributed and peer-to-peer nature.

Devanshu Trivedi et al. (2016) suggest that segregating database columns based on their sensitivity level and creating referential integrity at runtime can increase the security of the system. This approach ensures that all metadata is isolated from each other, making unauthorized access to the database system more difficult.

Mohammad Javed Morshed Chowdhury et al. (2018) note that one of the significant advantages of blockchain technology is its immutability, which is achieved through decentralization.

III. EXISTISTING SYSTEM

When an E-commerce application stores all customer and product data on a single centralized server, it can be vulnerable to crashes or hacks that would render the service unavailable to other customers. To address this issue, the application can be migrated to a blockchain system that maintains the data across multiple nodes or servers. In the blockchain system, if one node goes down, customers can still access the data from other working nodes, ensuring the availability and reliability of the service.

IV. PROPOSED SYSTEM

Blockchain offers several advantages such as data encryption, immutability, and the ability to associate each block with a unique hash code for secure storage. In our project, we utilized the Ethereum blockchain with Truffle for E-commerce data storage. However, since blockchain cannot store images directly, we implemented IPFS server to store product images and retrieve them by providing a hash code.

For user management, the application offers login and signup functionality for both consumers and suppliers. Suppliers are able to add new products with images, update product quantities, and view orders from customers. Meanwhile, customers are able to browse products and place orders.

V. RESULTS

To interact with the blockchain, we can write Solidity functions to perform actions such as user signup, adding products, and booking orders. After writing the code, we need to deploy the Solidity contract on the Ethereum blockchain. Once the contract is deployed, we can call its functions using the WEB3 Python packages to interact with the blockchain. This allow us to perform various actionon the Blockchain, such as reading and writing data to the contract, creating new transactions, and verifying transaction using standard methods. It's important to note that there are tools and libraries available.

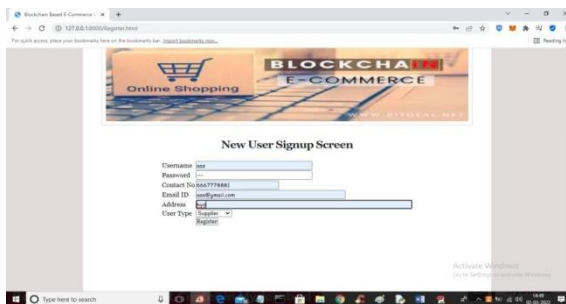


Fig. 1.The supplier begins by signing up and then clicking the "Register" button to access the next screen.



Fig 2. After completing the signup process as seen in the above screen, the supplier can add a consumer user.

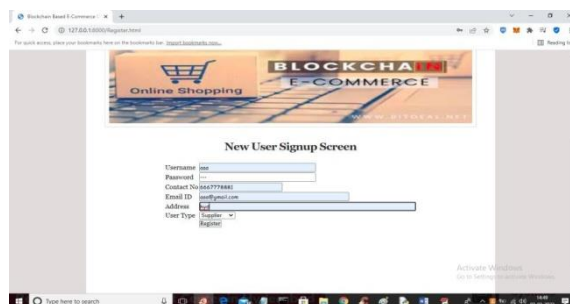


Fig 3. Customer is registering and now clickon 'Login' link to get below screen



Fig 4. Once the supplier logs in, they will be directed to the screen shown below.



Fig 5. To add new product details, click on the "Add New Products" link on the screen displayed above

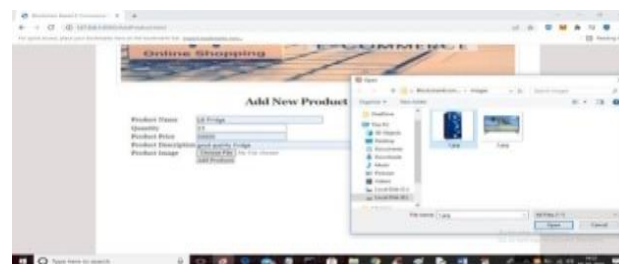


Fig 6. To add a new product with an image, enter the product details.



Fig 7. hash code of the image stored in IPFS.

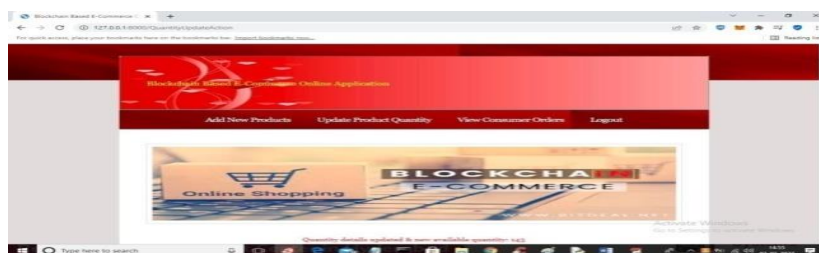


Fig 8. After logging in, the customer will be directed to the screen shown below.



Fig 9. The user can view the list of products and click on the "Click Here" link to place an order for the selected product.



Fig 10. The red text in the above screen indicates that the order has been completed successfully. The supplier can now log in to view the order.



Clicking on the "View Consumer Orders" link in the above screen displays the order details, including the customer's contact information and delivery address. The supplier can now proceed with the product delivery. The supplier can repeat this process and add products for purchase any number of times.

VI. CONCLUSION

The existing E-commerce application currently stores all customer and product data in a single centralized server. However, if the server crashes due to an overwhelming number of requests or a successful hack, the services become unavailable to all customers. To solve this problem, we are migrating the E-commerce application to use blockchain technology to store data across multiple nodes/servers. If one node goes down, customers can still access data from the other working nodes. We chose to use the Ethereum blockchain with Truffle to store data, and since blockchain cannot store images, we are using IPFS to store product images. IPFS will store the image and return a hash code that we can use to retrieve the image. By doing this, we are able to enhance the reliability and security of our E-commerce platform.

VII. REFERENCES

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