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Digimart—A Blockchain Based E Commerce

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ABSTRACT - The blockchain is a revolutionary technology that offers new solutions for solving problems in distributed environments. In this project, we have designed an ecommerce website called "DigiMart" that is built on the Ethereum blockchain. Our goal is to provide a decentralized platform for buying and selling digital products, which removes the need for a centralized intermediary. To achieve this, we have leveraged the features of the Ethereum blockchain, including smart contracts and decentralized storage. The smart contracts enable us to automate the process of buying and selling digital products, while the decentralized storage using IPFS(Interplanetary File System) ensures that the products are securely stored on-chain, but can be accessed and downloaded by buyers whenever they want. Our proposed framework provides a secure, transparent, and immutable system for buying and selling digital products. By leveraging the Ethereum blockchain's features, we are able to minimize the risks associated with traditional ecommerce platforms, such as fraud, data breaches, and unauthorized access. The design and implementation of the system are discussed in detail, and we have evaluated its potential advantages and limitations. Our results show that the proposed blockchain-based ecommerce website can significantly enhance data security, integrity, and accessibility, while minimizing the risks associated with traditional ecommerce platforms. In summary, DigiMart is a novel approach to ecommerce that leverages blockchain technology to provide a secure and decentralized platform for buying and selling digital products.

KEYWORDS: blockchain, ecommerce, digital products, decentralized storage, Ethereum, security, transparency.

I. INTRODUCTION

Digimart is a blockchain-based e-commerce platform that specializes in the buying and selling of digital products. This includes items such as music, software, eBooks, online courses, and more. The platform utilizes the Ethereum blockchain to ensure secure and transparent transactions for both buyers and sellers. By using a decentralized ledger, transactions are recorded immutably, making it nearly impossible for fraudulent activity to occur. Additionally, all transactions are conducted using cryptocurrencies, making it easier for users to make purchases from anywhere in the world without worrying about currency conversion rates. One of the unique features of Digimart is its use of IPFS for file storage. This allows sellers to upload their digital products

onto the platform in a way that is decentralized and secure. Unlike traditional e-commerce platforms, which often rely on centralized servers to store files, Digimart ensures that files are stored on a distributed network of computers, making it nearly impossible for data loss to occur. The platform also includes a seller management dashboard that allows vendors to manage their products, sales, and transactions. Additionally, Digimart provides an integrated digital wallet that enables users to store and transact with cryptocurrencies such as Ether. This also means that files can be easily accessed from anywhere in the world, without any delays or interruptions. Another important aspect of Digimart is its use of Firebase for metadata management. One of the main advantages of using Digimart is its security features. The platform utilizes blockchain technology to secure all transactions and maintain a tamper-proof record of every purchase and sale. This provides a level of security that is not available in traditional e-commerce platforms. In addition, Digimart eliminates the need for intermediaries, such as banks and payment processors, thereby reducing costs and increasing efficiency. This information is stored securely on Firebase servers, ensuring that it is easily accessible and can be updated in real-time. Digimart also makes use of Metamask, a browser extension that allows users to interact with the Ethereum blockchain. This means that all transactions conducted on the platform are conducted using cryptocurrencies, which are transferred directly from the buyer to the seller. Digimart also offers a user-friendly interface that makes it easy for buyers and sellers to navigate the platform. The platform offers features such as product search, filtering, and sorting, as well as a shopping cart and checkout process that is simple and straightforward. In addition, sellers can easily list their products for sale on the platform and manage their inventory

through the seller dashboard This eliminates the need for third-party payment processors, reducing the risk of fraudulent activity. Overall, Digimart is an innovative platform that leverages the power of blockchain technology to create a secure and efficient marketplace for digital products. By using Ethereum blockchain, IPFS, Firebase, and Metamask, Digimart provides a user-friendly interface that allows buyers and sellers to interact with each other in a safe and secure way. With its emphasis on digital products, Digimart is well-positioned to become a leader in the fast-growing e-commerce industry, and is an exciting example of how blockchain technology can be used to create new opportunities for online transactions. Overall, Digimart provides a secure, decentralized, and user-friendly platform for buying and selling digital products. Its use of blockchain technology ensures that all transactions are secure and transparent, while its intuitive interface makes it easy for users to conduct transactions on the platform.

II. LITERATURE SURVEY

- Gumroad:-
 1. Lack of Transparency: Traditional e-commerce platforms often lack transparency in terms of tracking the origin of products, and verifying the authenticity of products. This can lead to a lack of trust among customers, as they are unable to verify the legitimacy of the product.
 2. Security Concerns: Traditional e-commerce platforms are often vulnerable to data breaches and cyber attacks, which can result in the loss of sensitive customer information, such as credit card numbers and personal data. This can damage the reputation of the e-commerce platform and lead to financial losses.
- Shopify:-
 1. Centralized control: Shopify is a centralized platform, which means that it is controlled by a single company. This can make it easier for the platform to be hacked or for users to lose control of their data.
 2. Limited privacy: Shopify requires users to provide personal information, such as their name and address, to create an account. This information is stored on Shopify's servers, which can make it vulnerable to hacking or data breaches.
- Amazon:-
 1. Lack of Privacy: Amazon/Flipkart may collect and use customer data for various purposes, such as targeted advertising or product recommendations.
 2. Centralized Payment Options: Amazon has country based payment options, which can be a barrier for customers who prefer to pay using cryptocurrencies or other alternative payment methods.

III. PROBLEM STATEMENT

The traditional ecommerce platforms for buying and selling digital products have several issues that affect both buyers and sellers. Firstly, the centralized nature of these platforms makes them vulnerable to data breaches, fraud, and unauthorized access. Secondly, the intermediaries involved in these platforms charge high transaction fees, which can significantly reduce the profits of the sellers. Lastly, the lack of transparency in the process can lead to disputes between the buyers and sellers. To address these issues, we propose a blockchain-based ecommerce platform called "DigiMart" that leverages the features of the Ethereum blockchain to provide a decentralized and transparent platform for buying and selling digital products. By using smart contracts and decentralized storage, we aim to eliminate intermediaries and provide a secure and cost-effective solution to buyers and sellers. The proposed platform will also provide transparency in the buying and selling process, thereby reducing the likelihood of disputes between the parties.

IV. PROPOSED SYSTEM

The main purpose of Digimart is to provide a secure and trustworthy platform for buying and selling digital products. To ensure data authenticity and quality, a blockchain-based system will be implemented. The Ethereum blockchain will be used to store all the transaction data and maintain a secure record of all transactions. The use of blockchain technology provides transparency and immutability, which enhances the trustworthiness of the platform. In addition to the blockchain technology, Digimart will use IPFS for distributed file storage. IPFS will allow the platform to store files securely and efficiently, reducing the risk of data loss or tampering. By using IPFS, Digimart can provide a reliable and secure platform for selling digital products. Digimart will also use a

smart contract-based system to handle transactions. Smart contracts will automate the transaction process and ensure that all transactions are executed in a secure and transparent manner. The use of smart contracts will eliminate the need for intermediaries and provide a more cost-effective and efficient platform for buying and selling digital products. To ensure the authenticity and quality of the digital products, Digimart will implement a review-based system where users can post comments and ratings on the products. This system will enable new customers to assess the quality of the products and help to build trust in the platform. Overall, the proposed solution for Digimart involves the use of blockchain technology, IPFS, smart contracts, and a review-based system to provide a secure, transparent, and trustworthy platform for buying and selling digital products. This solution will help to ensure that customers receive high-quality products, while also providing a stable business environment for the owners of the platform.

V. METHODOLOGY

The methodology for developing the Digimart website involve the following steps:

- User Registration/Login Process:

The system will allow users to register themselves and create account. When signing/login users will require their passwords for authentication Users shall be able to login and log out. The user after successful registration is redirected to the user dashboard where it is required to login via MetaMask account. The very first MetaMask wallet address is captured and mapped along with logged in user and stored in the user database.

- Add Product Process:

Once the user has logged in with email and is verified, then he will be able to add new product via the user dashboard. The product could be in any format but must be in accordance with the list provided by the digimart. The user has to add the product then enter a description for the product and click on addproduct. This triggers a blockchain transaction and then the user is accepted to pay the required amount of gas fee and complete the transaction. Storing documents directly is a gas intensive

process in blockchain. To solve this problem blockchain provides us with Inter Planetary File System (IPFS) which stores documents securely as hashes and returns a CID (Content Identifier) which is stored in the blockchain as string.

- Product Management:

When a user adds a new product to the DigiMart platform, the product data is stored on firebase and original product file is stored on IPFS. When a transaction is initiated on the DigiMart platform for adding product, MetaMask calculates the gas fees required for the transaction and prompts the user to confirm the payment. Once the payment is confirmed, the smart contract is executed, and the product is successfully added to the Ethereum blockchain. The user can edit the metadata of the product like name, cost of the product, preview images, tags, description etc. The user can activate or deactivate his product based on his choice the product will be displayed or hidden from the shopping page.

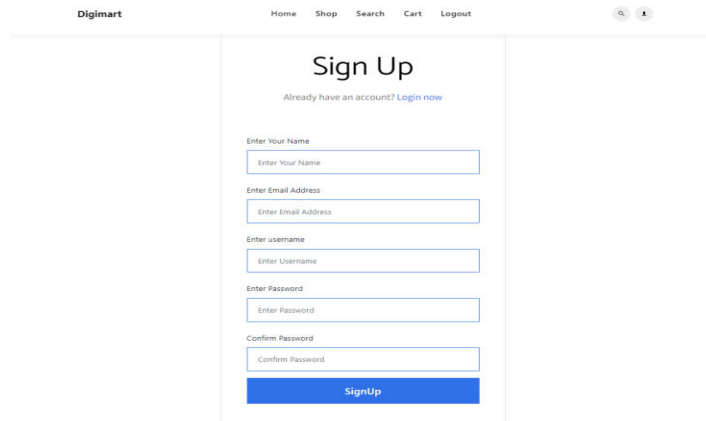
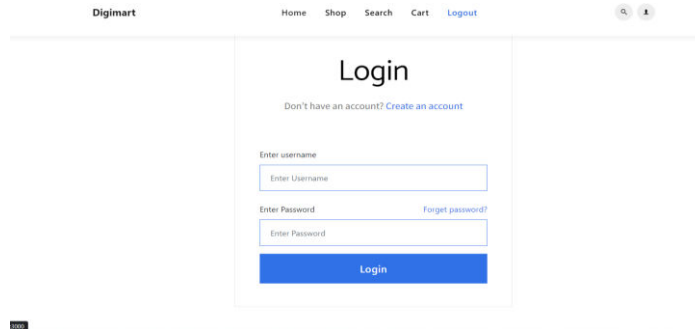
- Buy Product:

The user after successfully logging in via email can view the products listed by others. The user can add the desire product to the cart and after making successful transaction of ethers, user can see the bought products in the Orders section of the profile page, where user can download the bought products.



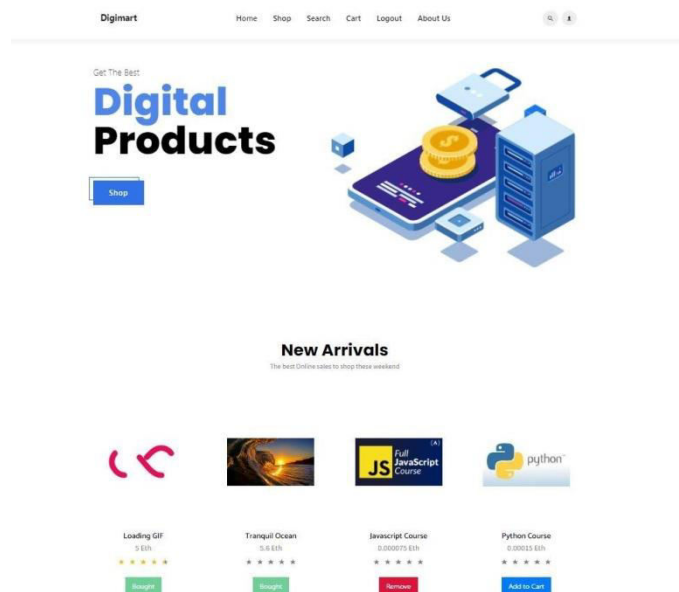
VI. RESULTS

Login and Register Page



Users will log into the system using email and password or register if they do not have an account.

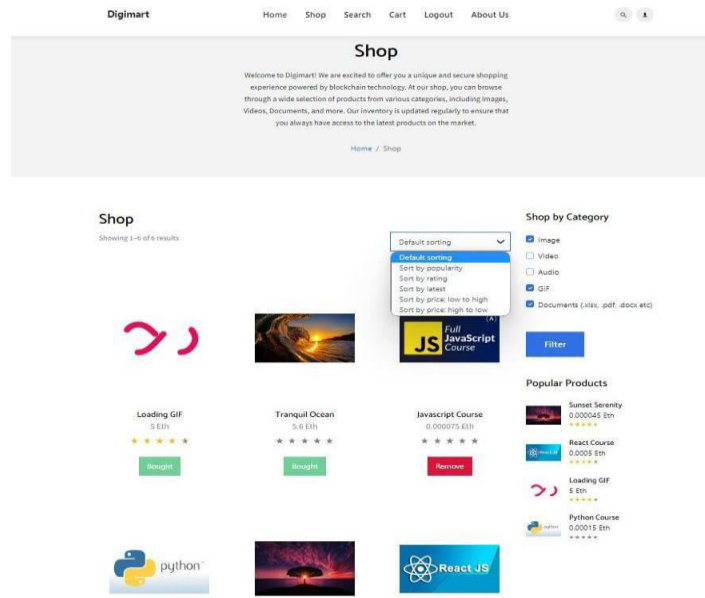
Home Page





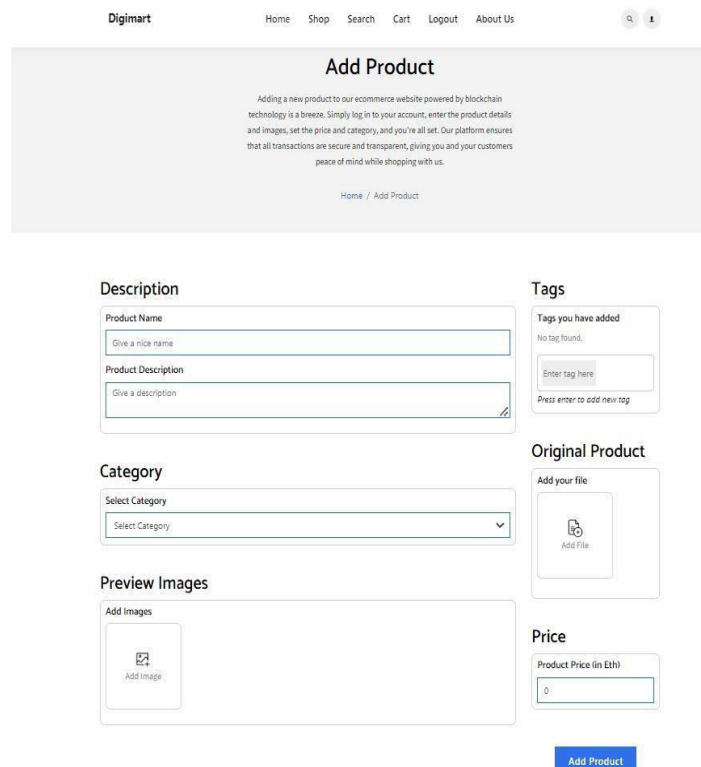
The Home page features a 'Shop' button and 'New Arrivals' section showcasing the latest products with ratings, built using React.js and Bootstrap.

Shop Page



Our 'Shop' page offers sorting and filtering options with a convenient display of previous purchases and cart items for a seamless shopping experience.

Search Page





Digimart's search page enables quick and efficient product searches based on name and tags, with relevant results sorted for enhanced user experience.

Add Product Page

The 'Add Product' page enables sellers to easily add new products to our platform by filling in the required fields, including name, description, tags, category, original product, preview images, and price.

Cart Page

The image shows two screenshots of the Digimart website. The top screenshot is the search page, which features a search bar with the text "Loading" and a search button. Below the search bar, there is a message: "Search results for 'Loading'". The bottom screenshot is the cart page, which displays a table with one item: "Javascript Course" priced at "0.000075 Eth". To the right of the table is a "Cart totals" section showing a subtotal of "0.000075 Eth", a token used of "0", fees of "0.00000375 Eth", and a total of "0.0000787500 Eth". A "Proceed To Checkout" button is located at the bottom of the cart totals section.

Product	Price
Javascript Course	0.000075 Eth

Cart totals	
Subtotal	0.000075 Eth
Token Used	0
Fees (5%)	0.00000375 Eth
Total	0.0000787500 Eth



The cart page in Digimart displays all the products added by the user for purchase. Users can remove items or proceed to checkout with just a few clicks, making the shopping experience fast and easy.

Profile Page

The screenshots show the following sections of the Digimart profile page:

- Account - General Information:**
 - User Name: yashm25
 - Email: yashmistry121@gmail.com
 - Name: Yash Mistry
 - primaryAddress: C6f72bc226d335646ca395d1oct18d1ba0617bd4fo
 - Save All button
- Account - Products:**

Thumbnail	Name	Price	Edit	Action
	JavaScript Course	0.00075 Eth		Deactivate
	Python Course	0.0015 Eth		Deactivate
	Sunset Serenity	0.00045 Eth		Deactivate
- Account - Orders:**

Thumbnail	Name	Price	Download
	Tranquil Ocean	5.6 Eth	
	Loading GIF	5 Eth	
- Account - Transactions:**

Hash	Products	Amount	Timestamp	Action	Status
0d5df8e699a0e041 awc19038d16867 a33aed79a4954d7 530196a20ea0a3b bc51	[jusbMgprNE.ShedUq7dU-M]	+0.000750000 Eth	4/20/2023, 11:20:45 AM	Credit	Success
0d44f836c601ba2fb 436a2c539c50779 9909d839e401313 8c23219c30f9d4f 39c2	[fP5c195Hv8UjnpOD3UQ]	-5.250000000 Eth	4/20/2023, 10:40:37 AM	Debit	Success
0dc488db696660 25636225cc39c57d 3cc955f4b0bc223e 296ad8a728612af b	[Kfivk2EyaVegpLrL]	-5.880000000 Eth	4/20/2023, 10:39:56 AM	Debit	Success

Digimart offers various features to manage user profiles, products, orders, and transactions. Users can view and edit their profiles, manage their product listings, view and download their purchased products, and access



their transaction history. These features provide users with greater control over their activities on the platform and make their overall experience seamless and enjoyable.

VII. CONCLUSION

In conclusion, Digimart is a blockchain-based ecommerce platform that provides a decentralized, transparent, and secure solution for buying and selling digital products. By leveraging Ethereum blockchain and IPFS protocol, Digimart eliminates intermediaries and provides secure and cost-effective solutions to buyers and sellers. The platform offers features such as smart contracts, decentralized storage, Metamask integration, and transparent transaction tracking. Overall, Digimart has the potential to revolutionize the ecommerce industry by addressing the issues faced by traditional ecommerce platforms and providing a secure and efficient solution for digital product transactions.

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- [6] **Shopify:** <https://shopify.com/>
- [7] **Amazon:** <https://amazon.com/>



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