

NFT – MARKETPLACE USING ICP BLOCKCHAIN AND CUSTOM TOKENS

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Abstract - The Cutting-Edge ICP Blockchain Marketplace is a groundbreaking platform revolutionizing NFT trading through the innovative utilization of the Internet Computer Protocol (ICP) blockchain. Our marketplace provides a secure, transparent, and tamper-proof environment for buying, selling, and trading NFTs. With a user-friendly React frontend, users can seamlessly navigate through a diverse collection of NFTs, including digital artwork, collectibles, virtual real estate, and domain names. Simplified trading processes empower users to list NFTs, set prices, and engage in secure transactions effortlessly.

Curated collections feature exceptional NFT artworks and rare collectibles, fostering creativity and passion within our community. Through the immutability and transparency of blockchain technology, our marketplace ensures the authenticity and provenance of each NFT, establishing a trusted ecosystem for users to explore and exchange digital assets with confidence.

Key Words: NFT Marketplace, digital assets, ICP Blockchain

1. INTRODUCTION

The AvaxGod project is an innovative initiative aimed at revolutionizing the NFT (Non-Fungible Token) marketplace by integrating cutting-edge technologies and creating a dynamic platform for buying, selling, and trading digital assets. Developed by the Advance Virtual Art eXchange Group of OpenD, AvaxGod harnesses the power of blockchain, specifically the Internet Computer Protocol (ICP) Blockchain, to establish a secure, transparent, and tamper-proof environment for NFT transactions.

In this report, we will delve into the key features, technologies used, implementation details, and the overall impact of the AvaxGod project. From its inception in October 2023 to its completion in February 2024, AvaxGod has set new standards in the realm of digital asset exchange, providing users with an intuitive, user-friendly platform to explore and engage with a diverse range of NFTs.

Through this report, we aim to provide insights into the development journey of AvaxGod, highlighting its significance in the context of the rapidly evolving NFT landscape and its potential to reshape the way digital assets are traded and experienced in the virtual realm.

2. EXISTING SYSTEM

2.1 What is a NFT market?

An NFT (Non-Fungible Token) marketplace platform is an online marketplace specifically designed for buying, selling, and trading NFTs. NFTs are unique digital assets that are tokenized on a blockchain, making them indivisible and distinguishable from one another. These platforms provide a venue for creators to mint and showcase their digital artworks, collectibles, virtual real estate, and other unique items, while also offering opportunities for collectors and investors to discover and acquire these assets.

Key features of NFT marketplace platforms include:

1. **Minting Tools:** Tools and interfaces that enable creators to mint their digital assets as NFTs, providing them with unique token identifiers on the blockchain.
2. **Listing and Auctions:** Functionality for listing NFTs for sale or auction, allowing creators to set prices or start bidding processes for their assets.
3. **Discoverability:** Search and browsing features that help users discover new and interesting NFTs, including curated collections, trending items, and personalized recommendations.
4. **Transaction Processing:** Infrastructure for facilitating secure and transparent transactions between buyers and sellers, including payment processing and asset transfer mechanisms.
5. **Royalty Mechanisms:** Support for royalty mechanisms that enable creators to earn ongoing royalties from secondary sales of their NFTs, ensuring ongoing compensation for their work.
6. **Community Engagement:** Features for fostering community engagement and interaction, such as forums, social sharing, and collaboration tools.

2.2 Problems with traditional NFT platforms

Traditionally, the NFT marketplace operates on centralized platforms or marketplaces that lack transparency, security, and user control. These platforms often face issues such as:

Lack of Transparency:

Users have limited visibility into the authenticity and provenance of NFTs, leading to concerns about counterfeit or dubious assets.

Centralized Control:

Centralized platforms exert control over the trading process, including fees, listing policies, and transaction procedures, which may restrict user autonomy.

Security Risks:

Centralized platforms are susceptible to hacking, fraud, and data breaches, posing risks to users' assets and personal information.

Limited User Experience:

User interfaces may lack intuitive design, responsiveness, and customization options, resulting in a suboptimal user experience.

2.3 Objectives of the Study

The objectives of the AvaxGod project are outlined as follows:

Developing a Cutting-Edge NFT Marketplace: The primary objective of the project is to create a state-of-the-art NFT marketplace leveraging advanced technologies such as the Internet Computer Protocol (ICP) Blockchain. This marketplace aims to provide a secure, transparent, and tamper-proof environment for buying, selling, and trading digital assets.

Enhancing User Experience: Another key objective is to prioritize user experience by designing an intuitive and visually stunning frontend using React. The platform aims to offer seamless navigation, engaging interfaces, and responsive design across various devices to ensure a user-friendly experience.

Expanding NFT Offerings: The project seeks to offer a comprehensive range of NFT listings covering diverse categories such as digital artwork, collectibles, virtual real estate, domain names, and more. By catering to a wide array of interests, the platform aims to appeal to and serve the needs of every NFT enthusiast.

Facilitating Simplified Trading: AvaxGod aims to simplify the process of buying and selling NFTs through a user-friendly interface. Users will be able to list their NFTs for sale, set preferred prices or auction formats, and engage in secure transactions with ease, thus fostering a vibrant and dynamic marketplace ecosystem.

Curating Exceptional Collections: The project aims to curate and showcase exceptional collections of NFT artworks and rare collectibles. By highlighting creativity, passion, and unique digital assets, AvaxGod seeks to provide users with immersive experiences and opportunities to discover extraordinary NFTs.

Ensuring Security and Transparency: AvaxGod prioritizes the security and transparency of transactions by leveraging blockchain technology. Through the immutability and transparency of the ICP Blockchain, the platform ensures the authenticity and provenance of each NFT, thereby mitigating the risk of counterfeit or dubious assets.

2.4 Top NFT marketplaces

NFT marketplace platforms play a crucial role in the burgeoning digital asset ecosystem, providing a decentralized and accessible venue for creators and collectors to participate in the creation, discovery, and exchange of unique digital assets. They facilitate the monetization of digital creations, empower artists to reach global audiences, and offer collectors the opportunity to own and trade rare and valuable digital items.

1. OpenSea:

OpenSea stands at the forefront of the burgeoning NFT (Non-Fungible Token) market, offering a versatile platform for creators and collectors alike. Boasting a user-friendly interface and a vast array of digital assets, OpenSea has emerged as a leading marketplace in the realm of blockchain-based ownership. One of OpenSea's key strengths lies in its diverse range of NFT offerings. Whether it's digital art, collectibles, domain names, virtual real estate, or other unique digital items, OpenSea provides a platform where creators can showcase their creations and enthusiasts can explore a myriad of digital assets.

A defining feature of OpenSea is its support for creators to mint their own NFTs directly on the platform. This capability empowers artists, musicians, game developers, and other content creators to tokenize their work, opening up new avenues for monetization and ownership in the digital realm. Moreover

In essence, OpenSea serves as a nexus for the burgeoning NFT ecosystem, providing a platform where creators can tokenize their work and enthusiasts can explore and invest in unique digital assets, thereby reshaping the landscape of digital ownership and expression.

2. Rarible:

Rarible is a dynamic NFT marketplace that offers a platform for creators and collectors to engage in the buying, selling, and trading of digital assets. With a focus on user-generated content, Rarible allows creators to mint their own NFTs, providing them with the tools to tokenize their artwork, music, videos, and more.

The platform features a diverse range of digital assets, including art, collectibles, and virtual goods, catering to a broad audience of creators and collectors alike. Rarible embraces decentralization and operates on the Ethereum blockchain, enabling transparent and secure transactions.

One of Rarible's notable features is its decentralized governance model, where RARI token holders have a say in platform decisions and improvements. This community-driven approach fosters a sense of ownership and participation among users.

Rarible has gained popularity for its easy-to-use interface and its support for emerging artists and creators. By empowering individuals to monetize their digital creations through NFTs, Rarible has played a significant role in shaping the landscape of the NFT ecosystem.

Overall, Rarible stands as a prominent player in the NFT space, providing a platform where creators can tokenize their work and collectors can discover and acquire unique digital assets, thereby facilitating new opportunities for creativity, expression, and ownership.

3. SuperRare:

SuperRare is a leading NFT (Non-Fungible Token) marketplace specifically tailored for digital artists to showcase and monetize their work. Unlike some other platforms, SuperRare operates with a curated approach, emphasizing quality and exclusivity in its collection.

Artists on SuperRare create limited edition digital artworks, which are then tokenized as NFTs (Non-Fungible Tokens) and sold to collectors. Each artwork is unique and authenticated on the blockchain, ensuring its scarcity and authenticity. This limited supply model adds value to the artworks and encourages collectors to acquire them as digital assets.

SuperRare's curation process involves selecting artists based on the quality and innovation of their work. This approach ensures that the platform maintains a high standard of artistic excellence, attracting both creators and collectors who appreciate fine art in the digital realm.

The platform also facilitates interactions between artists and collectors, allowing them to engage in discussions, collaborations, and transactions. SuperRare provides tools for artists to showcase their portfolios, track their sales, and connect with their audience, fostering a sense of community within the platform.

SuperRare operates on the Ethereum blockchain, leveraging smart contracts to facilitate transparent and secure transactions. Collectors can buy and sell artworks using cryptocurrency, with each transaction recorded immutably on the blockchain. Overall, SuperRare offers a premium experience for both artists and collectors in the NFT space, providing a platform where creativity thrives, and digital art finds its rightful place in the world of blockchain-based ownership and expression.

4. Nifty Gateway:

Nifty Gateway is a prominent NFT (Non-Fungible Token) platform that specializes in releasing limited edition digital art drops from popular artists, musicians, and brands. Launched in 2018, Nifty Gateway has quickly gained traction for its curated selection of high-quality NFTs and its user-friendly interface. One of Nifty Gateway's standout features is its focus on timed releases, or "drops," where a specific number of NFTs are made available for purchase over a set period of time. These drops often feature well-known artists and brands, creating excitement and anticipation among collectors. Nifty Gateway collaborates with a diverse range of artists, including digital artists, traditional artists exploring the digital medium, musicians, and celebrities. This diversity in content attracts collectors with varied interests and tastes, contributing to the platform's appeal and success.

The platform's user experience is designed to be accessible and intuitive, allowing collectors to easily browse, purchase, and manage their NFTs. Nifty Gateway supports transactions using both fiat currency and cryptocurrency, making it convenient for users with different preferences. Nifty Gateway operates on its own blockchain infrastructure, which enables fast and efficient transactions while maintaining the security and integrity of the platform. The platform also provides tools for artists to mint and list their NFTs, empowering creators to monetize their work and reach a global audience. In addition to its marketplace functionality, Nifty Gateway hosts special events and collaborations, such as virtual exhibitions, auctions, and exclusive drops, further enriching the platform's offerings and engaging the community.

6. KnownOrigin:

KnownOrigin is an Ethereum-based NFT platform founded in 2018, with a focus on supporting emerging artists and digital creators. It features a curated marketplace of original digital artworks, including illustrations, animations, and digital sculptures. KnownOrigin emphasizes authenticity and provenance, ensuring that each artwork is verified and authenticated on the blockchain.

The platform provides tools for artists to mint NFTs, set royalties, and engage with collectors through auctions and direct sales. KnownOrigin fosters a sense of community and collaboration among artists and collectors, encouraging meaningful interactions and exchanges. It supports charitable initiatives and social causes, allowing artists to donate proceeds from NFT sales to nonprofit organizations. KnownOrigin aims to empower artists by providing them with a platform to showcase their work and connect with a global audience of collectors and enthusiasts.

2.5 Top NFT ecosystem platform

Ecosystem platform No 1: Ethereum

Ethereum, a decentralized blockchain platform, serves as a foundational component of the NFT (Non-Fungible Token) ecosystem, providing the infrastructure for the creation, trading, and management of NFTs. At the core of Ethereum's functionality are smart contracts, which are self-executing agreements with predefined conditions written in code. These smart contracts enable the creation and implementation of NFT standards, such as ERC-721 and ERC-1155, which govern how NFTs are created, owned, and transferred on the Ethereum blockchain.

Through Ethereum's smart contracts, digital assets can be tokenized to create unique, non-fungible tokens. These tokens represent ownership of specific digital items, whether they're digital art, collectibles, virtual real estate, or other digital content. Each NFT is distinct, with its own set of properties and metadata stored on the blockchain, ensuring its authenticity and uniqueness.

The Ethereum blockchain acts as a decentralized ledger, recording all transactions involving NFTs in a transparent and immutable manner. This ensures that ownership of NFTs is securely tracked and verified, allowing users to buy, sell, and trade NFTs with confidence. Ethereum's robust infrastructure and widespread adoption make it the preferred platform for the majority of NFT projects, providing a reliable and scalable environment for the burgeoning NFT market to thrive. In summary, Ethereum's integration with the NFT ecosystem enables the seamless creation, transfer, and ownership of digital assets in a decentralized and transparent manner.

Ecosystem platform No 2: Ronin

Ronin serves as a layer 2 scaling solution tailored to enhance the functionality of the Ethereum blockchain, particularly concerning the NFT ecosystem. By addressing Ethereum's inherent scalability limitations, Ronin operates as a separate blockchain network connected to Ethereum, effectively functioning as a sidechain. This unique architecture enables Ronin to process transactions off-chain while still ensuring the security and integrity of the Ethereum mainnet. Through this approach, Ronin significantly improves the scalability of NFT transactions, allowing for a higher throughput and reduced congestion on the Ethereum network.

Moreover, Ronin's interoperability with Ethereum is a key feature within the NFT ecosystem. Despite being a distinct blockchain network, Ronin maintains seamless interoperability with Ethereum, enabling users to effortlessly transfer assets between the two networks. This interoperability is particularly crucial for NFT projects, as it facilitates the minting, trading, and interaction with NFTs across both platforms. Users can mint NFTs on Ethereum's mainnet and then seamlessly transfer them to Ronin for trading, thereby benefiting from reduced transaction costs and faster transaction speeds.

In essence, Ronin plays a vital role in augmenting the NFT ecosystem by providing a scalable and cost-effective solution for NFT transactions. Its integration with Ethereum ensures compatibility and interoperability, allowing users to leverage the advantages of both platforms seamlessly. As a result, Ronin contributes to the growth and sustainability of the NFT market by mitigating scalability challenges and enhancing the overall user experience for creators, collectors, and enthusiasts alike.

Ecosystem platform No 3: Solana

Solana, a high-performance blockchain platform, has gained prominence in the NFT (Non-Fungible Token) space due to its speed, scalability, and low transaction costs. Within the NFT ecosystem, Solana offers several advantages for creators, collectors, and developers alike.

At the heart of Solana's appeal is its architecture, which is designed to handle a high throughput of transactions with lightning-fast confirmation times. This scalability is particularly advantageous for NFT projects, where the minting, trading, and transferring of digital assets need to occur seamlessly and efficiently. Solana's high-performance infrastructure ensures that NFT transactions can be processed quickly and cost-effectively, enhancing the overall user experience for participants in the ecosystem. Additionally, Solana's low transaction costs make it an attractive platform for NFT creators and collectors looking to minimize fees associated with minting, buying, and selling digital assets. By leveraging Solana's blockchain, users can avoid the high gas fees often associated with Ethereum-based NFT transactions, making it more accessible for creators to tokenize their work and for collectors to acquire NFTs without incurring prohibitive costs.

Furthermore, Solana's developer-friendly environment and robust ecosystem of tools and resources make it an ideal platform for building innovative NFT applications and marketplaces. Developers can take advantage of Solana's programmability and interoperability to create unique NFT experiences, such as decentralized marketplaces, gaming platforms, and digital art galleries, driving further adoption and innovation within the NFT space. In summary, Solana's speed, scalability, low transaction costs, and developer-friendly ecosystem position it as a compelling platform for NFT projects.

Ecosystem platform No 4: Flow

The Flow blockchain ecosystem has emerged as a notable player in the NFT (Non-Fungible Token) space, offering a unique set of features and capabilities tailored for creators, collectors, and developers. Flow's architecture is designed to prioritize scalability and usability, making it an attractive platform for NFT projects. Unlike some other blockchains, Flow employs a novel approach to scalability known as "shared state sharding," which allows the network to scale horizontally while maintaining high throughput and low latency. This scalability ensures that NFT transactions can be processed efficiently, even during periods of high demand, providing a seamless experience for users.

One of Flow's key strengths is its focus on usability and developer experience. The platform offers a comprehensive set of developer tools and resources, including smart contract languages like Cadence, which are designed to be easy to learn and use. This developer-friendly environment encourages innovation and experimentation, empowering developers to build a wide range of NFT applications and experiences on the Flow blockchain. Flow's commitment to user experience extends to its digital wallet and marketplace infrastructure. The platform provides user-friendly wallets and marketplaces where creators can mint, showcase, and sell their NFTs, and collectors can discover and purchase new digital assets. This streamlined user experience makes it easy for both creators and collectors to participate in the NFT ecosystem, driving adoption and engagement. Furthermore,

Flow has established partnerships with leading brands, artists, and entertainment companies to bring high-profile NFT projects to the platform. These partnerships have helped elevate Flow's profile within the NFT community and attract a diverse range of creators and collectors to the platform.

3.PROPOSED SYSTEM

The Cutting-Edge ICP Blockchain Marketplace proposes a revolutionary solution that addresses the limitations of the existing system by leveraging the Internet Computer Protocol (ICP) blockchain. Our proposed system offers several key features and advantages:

Blockchain Technology:

Implementing blockchain technology ensures the immutability, transparency, and security of NFT transactions, providing users with confidence in the authenticity and provenance of each asset.

Decentralized Platform:

Our platform operates on a decentralized model, empowering users with greater control over their assets, transactions, and participation in the marketplace.

User-Friendly Interface:

A user-friendly React frontend offers seamless navigation, engaging interfaces, and responsive design, enhancing the overall user experience and accessibility.

Comprehensive NFT Listings:

Curate an extensive collection of NFTs spanning diverse categories, catering to the diverse interests of NFT enthusiasts and fostering a vibrant ecosystem of creativity and innovation.

Simplified Trading Processes:

Streamline the process of buying and selling NFTs through a user-friendly interface, enabling users to list their NFTs for sale, set prices or auction formats, and engage in secure transactions effortlessly.

Curated Collections:

Showcase curated collections featuring exceptional NFT artworks and rare collectibles, providing users with curated experiences and opportunities for discovery and exploration.

Community Engagement:

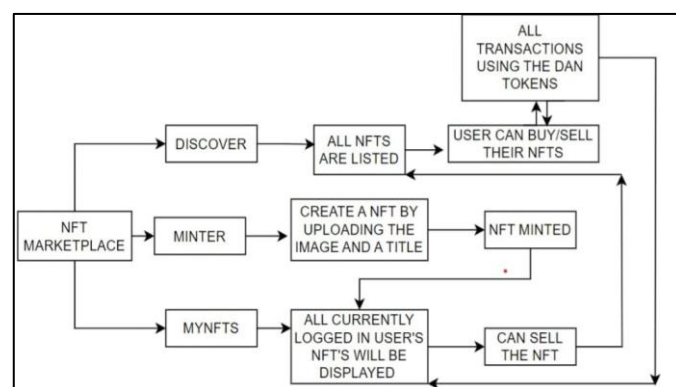


Fig 1: Proposed system block diagram

4. IMPLEMENTATION

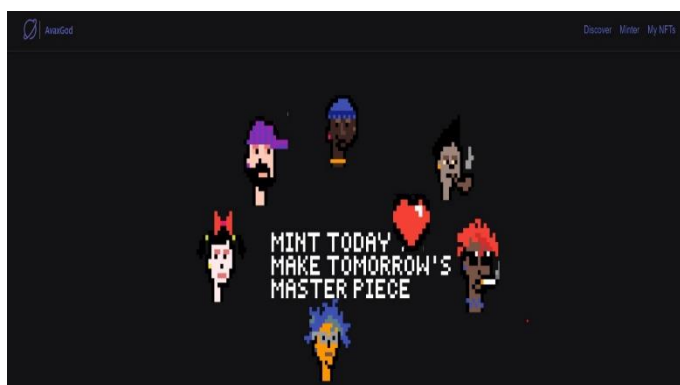


Fig 2 Home Page

The above Fig 2 represents the home page of avaxgod, in which it consists of three sections basically the discover section, the minter section and the my NFTs section.

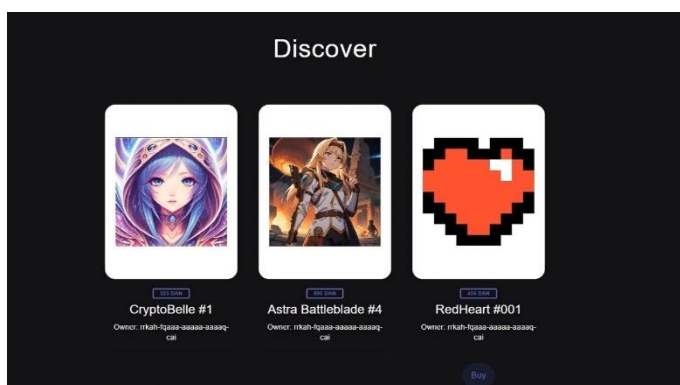


Fig 3 Discover Page

The above Fig 3 represents the discover section in which the user can list their own NFT's for selling and can buy other's creator NFT's.

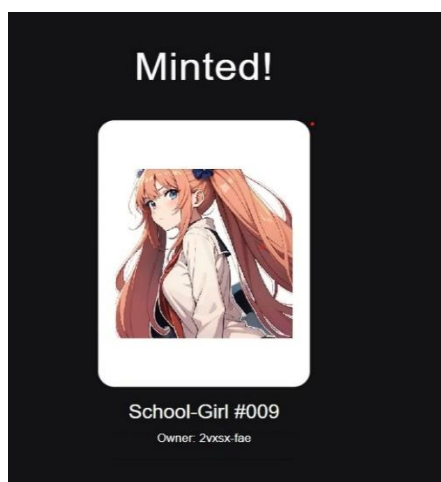


Fig 4 Minter Page

The above Fig 4 represents the minter section in which the user has to upload the image of the NFT and provide the suitable title for and then can mint that NFT.

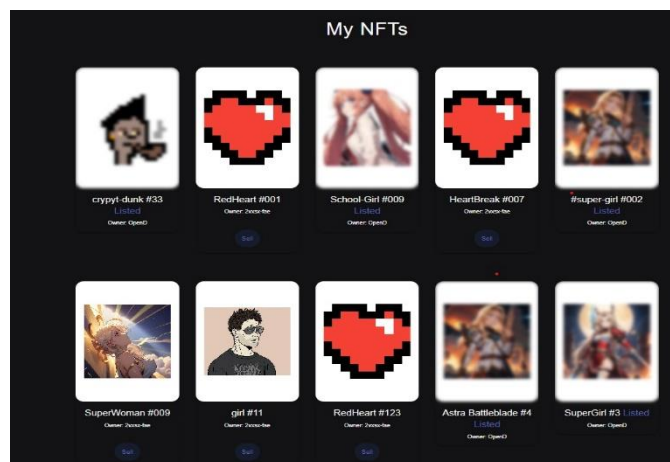


Fig 5 My NFT Page

The above Fig 5 represents the my NFT section in which the user can see all the NFT's that he/she had created or Bought and also can sell their NFT by specifying the required dan tokens for it.

4.1 Creating a faucet for buying and selling the NFTS

A faucet is a website or application that dispenses small amounts of cryptocurrency to users for free. These small amounts are typically called "faucet rewards" or "faucet drops." The purpose of a faucet is to distribute cryptocurrency to users for various reasons:

Promotion and Adoption: faucets are often used as a promotional tool to introduce people to a new cryptocurrency or blockchain platform. By giving away small amounts of cryptocurrency for free, developers and organizations can attract users and encourage them to explore and learn about the technology.

Testing and Development: Developers may use faucets during the testing and development phase of a blockchain project. Faucets provide an easy way for developers to obtain small amounts of cryptocurrency for testing smart contracts, decentralized applications (DApps), or other features of the blockchain network without needing to purchase coins on an exchange.

Education: Faucets can serve as educational tools for teaching people about blockchain technology and cryptocurrencies. By giving users, the opportunity to receive and interact with real cryptocurrency in a risk-free environment, faucets can help users understand how transactions work on a blockchain and how to manage cryptocurrency wallets.

Bootstrapping: In the early stages of a blockchain project, faucets can help bootstrap the network by distributing tokens to users and incentivizing participation. This can help increase liquidity and network effects, leading to a more robust and active ecosystem.

Overall, faucets play an important role in the blockchain ecosystem by facilitating the distribution of cryptocurrency to users for various purposes, including promotion, testing, education, and bootstrapping.

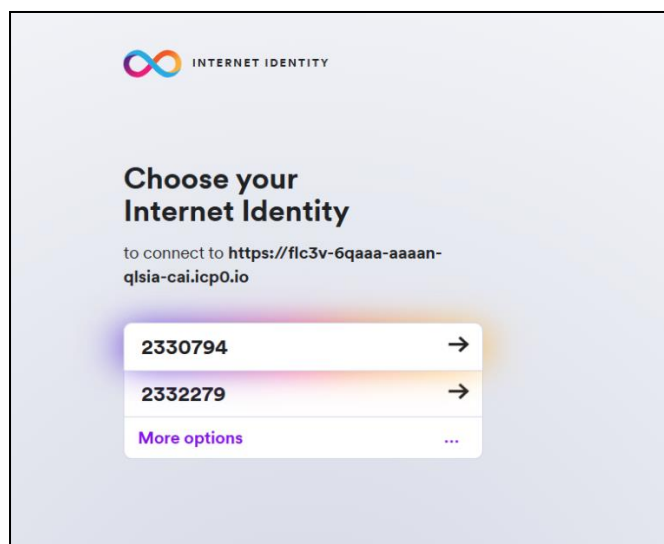


Fig 6 Login through internet identity

The above Fig 6 represents the interface of the identity application. The interface of the identity application allows users to log in without the need for username or password recognition. This ensures the confidentiality of the user while providing authentication to access all application services.



Fig 7 (a)



Fig 7 (b)



Fig 7 (c)
Fig 7 Faucet functionality

The set of figures 7 illustrates the Faucet functionality, with 7(a) depicting the basic interface of the Faucet function. A unique principal ID is displayed, remaining consistent throughout the account's existence. Upon clicking the 'Gimme gimme' button, the smart contract verifies if tokens are already allocated to the user. If not, 10000 tokens are allocated, and a 'success' message is displayed as depicted in Figure 7(b).

Conversely, if tokens have already been allocated, indicating a one-time process, an 'already claimed' message is shown as demonstrated in Figure 7(c).

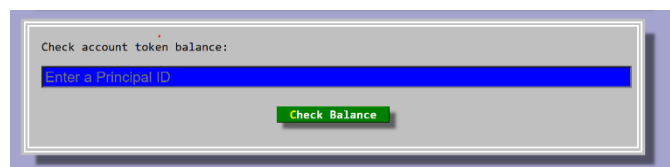


Fig 8 (a)

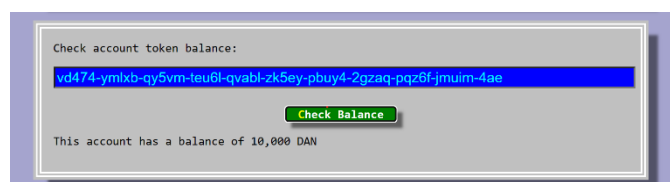


Fig 8 (b)
Fig 8 Check token balance function

The set of figures 8 illustrates the 'check token balance' functionality. In Figure 8(a), the basic interface of this function is displayed, featuring a text box where users can paste their principal address to check their account balance. By clicking the 'check balance' button, users can initiate the process to retrieve and display their account balance, as depicted in Figure 8(b).

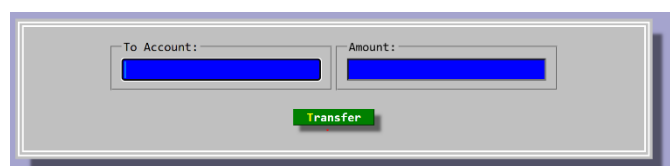


Fig 9 (a)

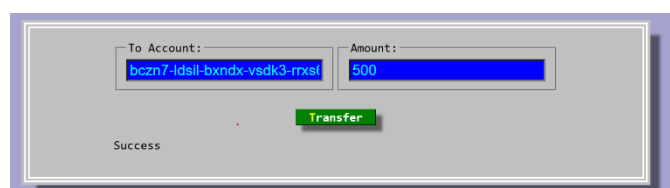


Fig 9 (b)

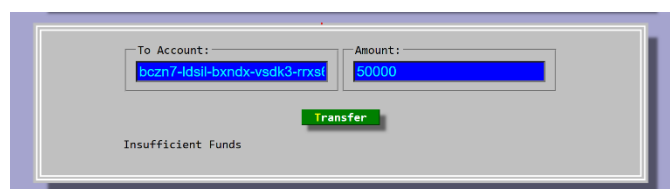


Fig 9 (c)
Fig 9 Token transfer function

The above set of figures 9 illustrates the token transfer functionality, with Figure 9(a) showcasing the basic interface. It features one textbox for entering the beneficiary's principal ID to transfer the tokens, and a second textbox for specifying the number of tokens to be transferred. Upon entering the

details, users can initiate the transfer process by clicking the transfer button.

If the sender has a sufficient balance in their account, greater than or equal to the specified transfer amount, the transaction will be successful, as depicted in Figure 9(b). However, if the smart contract verifies that the sender's balance is insufficient, an 'insufficient funds' message will be displayed, and the transaction will not proceed, as shown in Figure 9(c).



Fig 10 Complete interface of the application

The above figure 10 displays the complete interface of the application, showcasing the application name along with its three main functionalities: 'Faucet', 'Check Token Balance', and 'Token Transfer'. This comprehensive interface provides users with easy access to these key features, facilitating seamless interaction with the application.

3. CONCLUSIONS

In conclusion, the Cutting-Edge ICP Blockchain Marketplace represents a paradigm shift in the world of NFT trading, offering a transformative platform that combines cutting-edge technology with user-centric design. By leveraging the power of the Internet Computer Protocol (ICP) blockchain, we have created a secure, transparent, and user-friendly marketplace that empowers individuals to explore, discover, and transact with confidence in a decentralized ecosystem.

Through our intuitive React frontend, comprehensive NFT listings, simplified trading processes, and curated collections, we strive to provide users with a seamless and enriching experience that caters to diverse interests and preferences. Moreover, our commitment to security, transparency, and community engagement ensures that users can trust the authenticity and provenance of each NFT while fostering a vibrant and inclusive community of NFT enthusiasts.

As we look towards the future, we envision continued innovation, expansion, and collaboration within the NFT ecosystem. By embracing emerging technologies, exploring new NFT categories, forging global partnerships, and empowering community governance and participation, we aim

to further enhance the value proposition of our platform and create new opportunities for creativity, passion, and innovation.

We invite you to join us on this exciting journey as we continue to push the boundaries of what is possible in NFT trading, shaping the future of digital asset ownership and expression. Together, let us explore the limitless possibilities of the Cutting-Edge ICP Blockchain Marketplace and unlock the full potential of decentralized creativity and collaboration.

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