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NFTKART - A NFT Market place

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Abstract:*A non-fungible token (NFT) is a new kind of blockchain-based token that is unique and indivisible. They were first introduced in late 2017. Fungible tokens have pioneered new use cases such as initial coin offerings, but the value of his NFTs as a component is still unknown. This study fills a gap in theoretical and practical knowledge by demonstrating the effectiveness of NFTs in the event ticketing arena. Using a rigorous design science research approach, we design, build, and extensively evaluate a prototype event ticket system based on NFTs. As a result, we demonstrate how NFTs can be used to tokenize digital products, reduce fraud, and increase control over secondary market transactions. We also provide generalizable information on the benefits and challenges of NFTs and their implications for researchers and practitioners.*

Key Word :*NFTs, Blockchain, Polygon Testnet, Hardhat, Ethereum, NextJS, IPFS*

I.INTRODUCTION

Non-fungible tokens (NFTs) are unique and non-interchangeable units of data that can signify ownership of associated digital items, such as images, music, or videos. Supporters believe NFTs will be used in the future to represent ownership of physical items (e.g., a deed to a car or title to a house). Token "ownership" is recorded and tracked on a blockchain, a digital database that records data on a decentralized network of computers. NFTs can themselves be sold or traded in digital markets. However, ownership of an NFT does not necessarily correspond to legal ownership or grant copyright to a digital or physical item. NFT owners purchase only the right to the NFT's blockchain metadata or "token," not the underlying item, unless otherwise specified.

A non-fungible token (NFT) is a protection along with virtual statistics saved in a blockchain, a shape of disbursed ledger. The possession of an NFT is recorded withinside the blockchain, and may be transferred via way of means of the owner, permitting NFTs to be offered and traded. NFTs may be created via way of means of anybody, and require few or no coding abilities to create. NFTs usually incorporate references to virtual documents which include photos, videos, and audio. Because NFTs are uniquely identifiable, they vary from cryptocurrencies, which can be fungible. The marketplace price of an NFT is related to the virtual document it references.

It is a type of digital asset that represents ownership or proof of authenticity of a unique item or piece of content, such as artwork, music, videos, collectibles, or even virtual real estate. Unlike cryptocurrencies like Bitcoin or Ethereum, which are fungible and can be exchanged on a one-to-one basis, each NFT has distinct properties and cannot be exchanged on a like-for-like basis.

NFTs are built on blockchain technology, most commonly utilizing Ethereum'sblockchain, although other blockchains like Binance Smart Chain and Flow are also used. The blockchain serves as a decentralized ledger that verifies and records the ownership and transaction history of each NFT, ensuring its scarcity and uniqueness.

An NFT marketplace is a platform where individuals can buy, sell, and trade NFTs. These marketplaces act as intermediaries, facilitating transactions between buyers and sellers of NFTs. They provide a user-friendly interface for discovering, browsing, and bidding on NFTs, as well as managing digital wallets and transactions.

Proponents of NFTs claim that NFTs provide public certificates of authenticity or proof of ownership, but the legal rights conferred by NFTs may be uncertain. As defined in the blockchain, ownership of NFTs has no inherent legal meaning and does not necessarily confer copyright, intellectual property rights, or other legal rights in the associated digital files. There is none. NFTs do not restrict the sharing or copying of related digital files, nor prevent the creation of NFTs that refer to the same file.

II.MATERIAL AND METHODS

Building an NFT marketplace entails a number of important considerations and actions. You must first specify your aims and objectives for the market, as well as the categories of assets you wish to serve and the target market. Next, pick a blockchain platform that is appropriate and supports NFTs, such as Ethereum, Binance Smart Chain, or Flow. Create smart contracts that outline the NFT standard and put capabilities like coin minting, ownership transfers, and royalty

payments into place. Provide customers with the option to connect their digital wallets to the marketplace and provide a secure user authentication mechanism.

Create and implement an intuitive frontend interface that allows users to browse, search, and interact with NFTs. Offer tools for filtering, sorting, and comprehensive asset data. Implementing this capability would guarantee flawless interaction with the smart contracts and allow artists and other producers to mint and list their NFTs on the market. Including the implementation of transaction management, payment gateways, escrow services, and automatic royalty distribution methods, make it possible for users to purchase, sell, and bid on NFTs.

NFT (Non-Fungible Tokens) marketplaces have gained significant attention and growth in recent years due to the increasing popularity of blockchain technology and digital assets. NFTs represent unique digital assets that are stored on the blockchain, which can be bought, sold, and traded like physical assets. In this literature review, we will explore the current state of NFT marketplaces, their features, and the challenges and opportunities they present.

NFT marketplaces serve as platforms that allow creators to sell their digital assets in the form of NFTs. These marketplaces offer various features such as bidding, buying, selling, and trading NFTs. They also offer tools to create and mint new NFTs, as well as curating collections of NFTs for buyers to browse. Some of the popular NFT marketplaces include OpenSea, Rarible, SuperRare, and Nifty Gateway.

One of the significant challenges facing NFT marketplaces is the issue of scalability. As the popularity of NFTs continues to grow, the current infrastructure of the blockchain may not be able to handle the volume of transactions needed to support the marketplace's growth. Additionally, there are concerns regarding the environmental impact of NFTs, as the energy consumption required to create and maintain the blockchain network is significant.

NFTs exist on a blockchain, that's an allotted public ledger that data transactions as a non-fungible token. You are likely maximum acquainted with blockchain because the underlying procedure that makes cryptocurrencies possible. Specifically, NFTs are generally hung on the Ethereumblockchain despite the fact that different blockchains guide them as well. Basically, NFTs are like physical collectibles and s are digital only. So instead of hanging the actual oil painting on the wall, the buyer receives a digital file instead. NFTs are created or “created” from digital objects representing tangible and intangible items such as:

1. Art
2. GIFs
3. Videos and sports highlights
4. Collectibles
5. Virtual avatars and video game skins
6. Designer sneakers
7. Music

They additionally get different possession rights. That is right: NFTs will have handiest one proprietor at a time. NFTs precise statistics makes it smooth to affirm their possession and switch tokens among owners. The proprietor or author also can save precise records inner them. For instance, artists can signal their art work with the aid of using which includes their signature in an NFT's metadata.

Monetization strategies adopted by the most popular NFT marketplaces

1. **Listing fees** – the NFT platform charges sellers for posting (listing) their digital items.
2. **Transactions processing charges** – the marketplace takes a certain percentage from each transaction on their platform. For example, OpenSea charges a service fee of 2.5% for each sale.
3. **Initial setup fees** – the NFT marketplace charges content creators to list their first non-fungible token.
4. **Bidding charges** – buyers pay a particular fee for bidding successfully for a digital asset they want to acquire.
5. **Affiliate programs** – some NFT trading platforms may introduce specific affiliate programs for their partners.

III.PROPOSED MODEL & ARCHITECTURE OVERVIEW

Non-Fungible Token (NFT) marketplace is a platform that allows users to buy, sell, and trade NFTs. NFTs are unique digital assets that can represent anything from art to music, videos, and other types of media.

Some proponents assert that NFTs make transactions more efficient and secure. They predict that their use will expand to a wide array of applications beyond the digital collectibles markets, such as digital identity authentication, retail shopping, and real estate. Critics argue that NFTs are simply speculative investments, provide no additional value over existing systems, are prone to illicit activity and scams, and contribute to the “financialization of everything.

The implementation process for building an NFT marketplace involves several steps, including:

Designing the architecture: The first step in building an NFT marketplace is designing the architecture. This involves defining the technical specifications, such as the programming language, database technology, and the platform's backend infrastructure.

Developing smart contracts: Smart contracts are self-executing programs that run on a blockchain network. These contracts define the rules and conditions for NFT ownership, transfer, and other actions on the marketplace. Developing smart contracts requires expertise in blockchain development and programming languages such as Solidity.

Creating the frontend: The frontend is the user interface that buyers and sellers use to interact with the marketplace. The

frontend should be user-friendly, responsive, and intuitive. Web development skills such as HTML, CSS, and JavaScript are required to build the frontend.

Integrating payment systems: Integrating payment systems is a crucial step in building an NFT marketplace. The payment system should be secure, reliable, and support the payment of various cryptocurrencies.
Testing: Testing the marketplace is crucial to identify and fix bugs and ensure that the platform is secure, reliable, and user-friendly. Testing includes functional testing, security testing, performance testing, and usability testing.

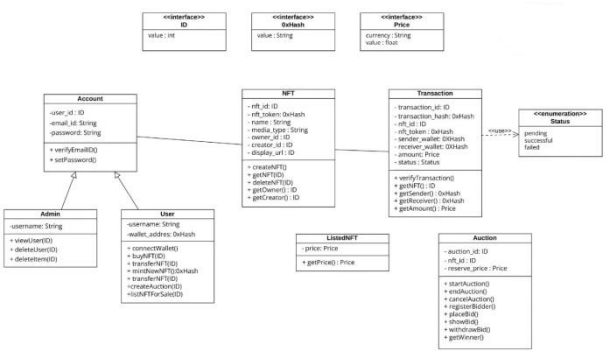

Fig 1: Backend Modals Class Diagram

In this simplified representation, the NFT Marketplace class represents the overall marketplace and manages NFTs and users. It has methods for adding and removing NFTs and users, as well as browsing and searching for NFTs.
The NFT class represents an individual NFT and contains properties such as its ID, title, description, token, creator, owner, and price.

The User class represents a user in the marketplace and includes properties like ID, name, and a Wallet object that holds the user's address and balance.

The Transaction class represents the transactions of NFTs between user which include properties like ID, nft_id, sender walletand receiver wallet address and amount. The Auction class facilitate the sale of NFT through competitive bidding and include properties link ID, nft_id, listing price

- Admin and User classes inherit from Account abstract class
- Listed Item classes inherit from Item abstract class.
- There is a composition relationship between User class and NFT class
- There is a composition relationship between Item class and Transaction class
- There is a composition relationship between Auction class and Listed Item class.

IV.RESULT

The results and analysis of an NFT marketplace can provide valuable insights into its performance, user engagement, and overall success. Here are some key metrics and analyses to consider:

Number of users: The number of users of an NFT marketplace is an important metric that can indicate its popularity and reach. This metric can be analyzed over time to identify trends and patterns in user growth.

Number of NFTs sold: The number of NFTs sold can indicate the marketplace's popularity and success in facilitating NFT sales. This metric can be analyzed to identify the most popular NFT categories or creators.

Sales revenue: Sales revenue is a key metric that can indicate the marketplace's financial success. This metric can be analyzed over time to identify revenue trends and patterns.

Conversion rate: Conversion rate is a metric that indicates the percentage of users who make a purchase on the marketplace. This metric can be analyzed to identify areas for improvement in the user experience or marketing strategies.

User Experience: Evaluate the user experience of the marketplace, including ease of navigation, search functionality, and responsiveness. Analyze user feedback, conduct surveys, or gather usability testing data to identify areas for improvement. Consider factors such as intuitive design, seamless onboarding, and transparent transaction processes.

Security and compliance: Security and compliance are critical factors for the success of an NFT marketplace. Regular security audits and compliance checks can ensure that the marketplace is secure, compliant with relevant regulations, and protected against potential legal or reputational risks.

Community Engagement: Assess the level of community engagement and interaction within the marketplace. Analyze user forums, chat channels, or social media groups associated with the marketplace. Measure the level of communication

and support provided to users and the impact of community-driven initiatives.

Future Growth and Scalability: Evaluate the marketplace's scalability and readiness for future growth. Consider the ability to handle increased user demand, new features, and expanding partnerships. Analyze the marketplace's adaptability to emerging trends and technologies in the NFT space.

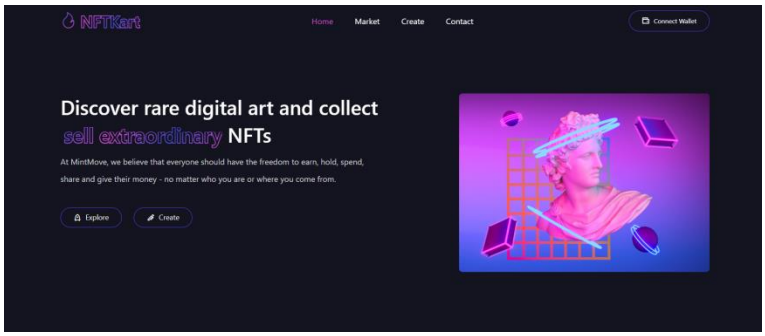

Fig 2: User Interface of NFT Interface

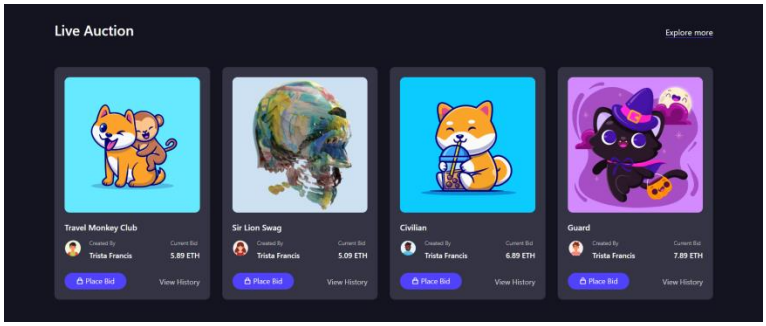

Fig 3: Live Auction of NFT Interface

Figure 4 shows the extreme increase in the trading volume of NFTs since early 2021. For example, on the single day of May 03, 2021, over $100 million worth of NFTs were traded, and the daily average trading volume of the year to date is much higher than in previous years ($6.13 million, compared to $0.18 million in 2020, $0.07 million in 2019, and $0.10 million in 2018). The figure also shows that the number of wallets on the Ethereumblockchain holding NFTs has increased significantly. For example, in March 2021, over 5,700 different wallets held NFTs. The two metrics clearly illustrate the increasing relevance of NFTs, both in terms of market volume and the number of users, as proxied by the number of blockchain wallets. The two cryptocurrencies also peaked in 2021, at $63,537 (BTC) and $4,172 (ETH) respectively, having traded significantly lower prior to that.

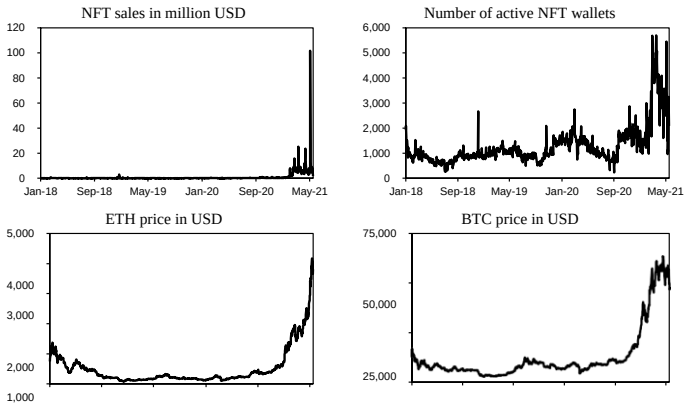

Fig 4: NFT and cryptocurrency market data

V.CONCLUSION

NFT marketplaces are online platforms where users can buy and sell non-fungible tokens (NFTs). NFTs represent digital ownership of unique assets such as digital art, collectibles, music, videos, and more. The current state of NFT marketplaces is dynamic, with platforms like OpenSea, Rarible, SuperRare, and Foundation leading the market. These marketplaces have different approaches to curation and tokenization, ranging from community approval to open creation and sales.

Looking ahead, NFT marketplaces are exploring new applications beyond art. Some platforms are exploring the integration of NFTs in the gaming industry, allowing players to own and trade unique in-game items. Virtual real estate is another area being explored, where users can own and trade virtual land in online worlds using NFTs.

The frontend interface offers intuitive browsing and search features, allowing users to easily discover and explore a diverse range of NFTs. Artists and creators have the ability to mint and list their digital assets, while buyers can seamlessly purchase or bid on desired NFTs. The transaction process incorporates secure payment gateways and escrow services, ensuring the safety and transparency of financial transactions.

The marketplace actively cultivates a vibrant community through social features, enabling users to interact, leave comments, and engage with artists. This fosters a collaborative and supportive environment where creators can showcase their work and connect with potential buyers. Regular updates and improvements to the platform ensure that it remains current and aligned with market trends and user feedback.

Security has been prioritized throughout the development process, with robust measures in place to protect user wallets, transactions, and sensitive data. Regular security audits are conducted to identify and address vulnerabilities promptly, ensuring a trustworthy environment for all participants.

The successful launch and marketing campaign have resulted in a growing user base and increased adoption of the marketplace. Ongoing monitoring and response to user needs and preferences continue to drive user satisfaction and engagement. The NFT marketplace serves as a testament to the potential of blockchain technology and its ability to revolutionize the way digital assets are owned, traded, and valued.

In conclusion, NFT marketplaces are rapidly growing in popularity and have the potential to disrupt various industries. While there are challenges regarding scalability and environmental impact, NFTs provide exciting opportunities for creators and collectors alike. As the technology continues to evolve, it will be interesting to see how NFT marketplaces develop and the impact they have on the broader economy.

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