
Comparing the characteristics of blockchains via building a NFT marketplace – A Survey

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ABSTRACT

In this attempt we try to focus on building an NFT market place on the Internet Computer using and comparing the application with the existing popular systems like Opensea etc., whose major transaction volume is on the Ethereum blockchain network. We intend to compare various aspects of functioning like transaction fee [also known as gas fee] and also check the system's ability to scale. We in the end intend to compare it with some of ethereum's modern alternatives like solana , cardano , etc., We would be using motoko as the language for interacting with the Internet computer and reactjs to build the front end of the application

KEYWORDS: *NFT marketplace , Internet Computer , Gas Fee , cardano , solana , motoko , reactjs.*

INTRODUCTION

Smart contracts are used to hold Non-Fungible Tokens, a non-exchangeable data unit, on the blockchain. However, this wasn't the blockchain technology's initial use. Blockchain technology was first solely utilised for financial and trade activities, but recent research has proven that it has much more extensive uses. This is as a result of the great degree of transparency offered by blockchain technology. For instance, it is possible to quickly and clearly trace the overall number of currencies and transactions worldwide. There is no need for a central authority to authorise or carry out activities because it is a peer-to-peer system. NFT tokens are immutable because to their unique qualities and intrinsic worth. Its characteristics differ from those of fungible tokens. NFT may be anything you find online, including music, games, and visual art. a digital signature that prevents trading or Nonfungible tokens are digital representations of ownership of anything that is fundamentally uncommon and one-of-a-kind, such as a work of art, a piece of music, a collection, an item from a video game, or real estate, whether it be a digital or physical asset. Platforms for storing, displaying, exchanging, and issuing NFTs are known as NFT markets. Artists can use specialised marketplaces to sell their NFT creations. The NFT Marketplace allows potential purchasers to search for the NFTs they want and quickly make an offer or purchase them.

Any item that may be replaced with a like or identical commodity is referred to as "fungible" and comes from economic and accounting literature. Traditional forms of currency are fungible, which makes them desirable as means of trade since they are believed to be of equivalent worth, whether they are identical quantities of paper money or the same quantities of precious metals. Since the two currencies are interchangeable, a five dollar bill may be exchanged for five one dollar notes. Fungible assets include things like regulated commodities, common shares, financial options, and bills of exchange.

A person's automobile, on the other hand, may be considered a non-fungible asset because someone who borrows a friend's car won't be able to pay back the loan by giving the friend their own car. Baseball cards, for instance, are a perfect example of nonfungible assets since each card has special qualities that either make it more valuable or less valuable than other baseball cards. It used to be thought that virtual objects needed to be difficult to differentiate from one another in order to be labelled "non-fungible." Code is code: 1s and 0s that may be created and are, thus, mostly interchangeable.

Digitization and technological development were not always seen as allies in the development of the arts sector. This attitude and point of view are going to change. Content producers, artists, and public

figures from a range of fields have dominated the news thanks to their participation in numerous Non-Fungible Token initiatives. Recognizing the potent tools and cutting-edge features offered by blockchain technology has enabled this departure from conventional company methods. The curve of novel business concepts involving tokens and tokenization processes has been directly correlated with the usability of such technology.

Distributed ledgers are now being implemented and developed with the help of blockchain technology. It makes it possible for a collection of participating nodes (or parties) to produce reliable and immutable services even when they do not trust one another. Distributed ledgers were first intended to serve as tamper-evident records for data recording and information sharing. They are normally maintained by independent parties without the assistance of any centralised authorities. Block-chain's success with cryptocurrencies like Bitcoin helped it gain popularity. Blockchain technology's advancements and expanding application domain have attracted a lot of public attention from academia and business, and they promise to transform every aspect of digital business in the sector. Blockchain is anticipated to have a significant impact on current Internet infrastructures and will encourage the growth of a decentralised Internet. This is due to the fact that all data stored on the blockchain can be viewed as digital assets, and because the blockchain provides guarantees of authenticity for these assets, they are immutable and tamper-proof.

Blockchains with smart contracts installed on them make it possible to create new classes of digital assets called tokens that can communicate with one another. Tokenization, the process by which digital information or assets are transformed into tokens, is generally applicable to all types of digital data or assets. After being tokenized, digital assets may be stored on the blockchain. Different blockchains might use various tokenization techniques. The Ethereum Request for Comments (ERC) series, which describe the essential functionalities and offer guidelines that a token should adhere to working properly on the Ethereum network, is currently the most well-known set of instructions for creating a token.

LITERATURE SURVEY

The reason for this study is to build an NFT marketplace on Internet Computer in an attempt to make it a scalable and a high throughput application. It is hosted on the web and is developed to be responsive using reactjs so as to be viewed via a browser on any device that is commonly used for such purposes.

[1] Rehman, Wajiha Zainab, Hijab Imran, Jaweria Bawany, Narmeen- The Study related to this paper is a descriptive overview of NFT'S and its technologies specifically blockchain and Ethereum. NFTs are transparent, traceable, and secure since they are built on blockchain technology, particularly Ethereum. Unique tokens' innovative property allowed for use cases that had never been proven, such exclusive ownership of digital assets. Each asset's ownership may be tracked, which improves authenticity. Art collectors and fans were drawn to the concept of having total possession of an original, bought digital asset, such as photographs, gifs, films, music, etc., which spurred a quick expansion in the market.

[2] A. Mani ,Adarsh- This article outlines a theoretical view of NFT and its role in creative media market. NFTs may be a relatively new technology that leverages the blockchain as its foundation, but it is already sufficiently developed for practical usage. Although its future as a key component of the creative media business is already sealed, it will also have many uses in other industries. We believe that as it develops, the community will quickly accept it, and in the long run, its growth will even surpass that of cryptocurrencies. The only drawback of NFTs being bad for the environment will vanish as the world moves closer to renewable sources of energy.

[3] Ante, Lennart- The study provides an overview of the implementation of the NFT market on the Ethereum blockchain. This page provides a statistical breakdown of the NFTS based on the quantity of sales, trade volume, transactions, and wallets..They have collected their data from NonFungible.com that provides the overall data of Ethereum. The methodologies they have used was VAR(Vector autoregression model).

[4] A. Popescu - With regard to application and utility in these difficult times, blockchain is seen as an innovative frontrunning technology due of the COVID-19 pandemic's drive for digitalization and digitization throughout all industry sectors. Through the process of tokenization, blockchain technology has made it possible to access assets that, up until this point, could not be swiftly and readily exchanged. One of the pillars of Decentralized Finance (DeFi) is tokenization, which is a built-in feature of many blockchain architectures. A token's characteristics and features open up a number of economic opportunities in addition to its primary use as network fuel.

[5] A. Popescu - Due to COVID-19 pandemic, the digital transformation is turning to be one of the biggest opportunities for digital assets adoption. It is a theoretical approach in which it will assess the innovative approach to different fields. This paper is focused on the features of NFT i.e traceability, ownership, authenticity, security

[6] C. Usman W – The research of tokenization on the blockchain are still in their initial stage. This paper presents a of Knowledge for existing methods on tokenization processes. Coming to fungibility, they have classified existing tokens into three key categories: fungible tokens, non-fungible tokens, and semi-fungible tokens. This paper serves as a starting point for exploring tokenization on blockchain.

[7] Dowling- Non-fungible tokens (NFT) utilised blockchain technology for the first time in early 2021 in a way that was readily apparent to the general public. The ownership of digital goods such as pictures, music, movies, and virtual creations is recorded in smart contracts on a blockchain, and NFTs are tradeable rights to such assets. They investigated if NFT price is related to cryptocurrency pricing given that the NFT market was founded on cryptocurrencies. Only a little amount of volatility transmission between cryptocurrencies and NFTs is shown by a spillover index. However, the low volatility transmissions also suggest that NFTs can be considered a low-correlation asset class.

[8] Dowling- One of the most prominent recent public triumphs of blockchain technology is the rise in popularity of non-fungible token (NFT) marketplaces. NFTs are rights to any digital asset, including pictures, films, music, and even pieces of virtual worlds, that can be sold on the blockchain. They investigated the value of virtual property pieces in Decentraland, the largest blockchain virtual world., which is an NFT referred to as LAND, as a first study of NFT pricing. They displayed a pricing series for LAND that exhibits both inefficiency and a consistent increase in value.

[9] Chalmers D-Blockchain-enabled cryptographic assets known as non-fungible tokens (NFTs) serve as evidence of ownership for digital items. In this quick response essay, they have examined the importance of NFTs for business owners in the creative industries. First, they concentrated on the new digital capabilities provided by the technology; second, they examined NFTs in light of the recent boom and bust in Initial Coin Offerings (ICO); and finally, they took a longer-term historical stance to examine how earlier speculative waves have impacted the current NFT economy.

[10] Aharon, David- This article looks at the correlation between non-fungible token (NFT) returns and those of other financial assets (equities, bonds, currencies, gold, oil, Ethereum) from January 2018 to June 2021. They can show that there was an overall increase in the connectedness between the returns for financial assets over the COVID-19 period using the Time-Varying Parameter Vector Autoregressions (TVP-VAR) method. Their static analysis shows that endogenous shocks are primarily responsible for the behaviour of NFT returns, with the impact of innovation on other assets being responsible for a far smaller portion of this variation. According to the research, NFTs are substantially resilient to shocks from common asset classes and even from Ethereum, a close sibling.

[11] Wilson- In this article, they defined NFTs, examine how they relate to blockchain technology and cryptocurrencies, how different businesses employ them, and discuss the benefits and dangers they pose. A conceptual diagram of an initial NFT ecosystem is their main contribution. By doing this, they offered a relational mapping of key players, including content producers, intermediaries in core and related technical and commercial activities, consumers, investors, and speculators. They have also emphasised management implications and link them to frameworks for conceptual exploitation and investigation.

An overview of the chosen literature

Authors and Year of publication	Title	Methodologies	Analyzed nft types
Wilson,Adam Karg,Hadi Ghaderi[11]	Prospecting non-fungible tokens in the digital economy:Stakeholders and ecosystem,risk and opportunity.	Concept/Model building	General Type
Dowling a 2022[7]	Is Non-fungible Token Pricing Driven by Cryptocurrencies?	Empirical Testing	Decentraland
Dowling b 2022 [8]	<u>Pricing non-fungible tokens</u>	Empirical Testing	Cryptopunk Decentraland
Aharon and Demir 2021 [10]	NFTs and Asset Class Spillovers: Lessons from the Period around the COVID-19 Pandemic.	Empirical Testing	General Type
Chalmers D[9]	Beyond the bubble: Will NFTs and digital proof of ownership empower creative industry entrepreneurs?	Descriptive Research	General type

Performance Comparison:

Parameter	Ethereum	Cardano	Solana	Internet computer
Transaction speed	15-20 tps	2tps	2k-3k tps	11,500 tps
Transaction time taken	14 minutes	10-60 minutes	21-46 seconds	1 second
Scalability	Not scalable	Not scalable	Not scalable	scalable
Storage cost	\$73000000/gb	Insufficient storage	\$1000000/gb	\$5/gb

Conclusion

The reason for this study is to build an NFT marketplace on Internet Computer (ICP) in an attempt to make an application that is scalable and has high throughput .The study intends to look in to major challenges like transaction fee and time taken per transaction etc., It is hosted on the web and is developed to be responsive using reactjs so as to be viewed via a browser on any device that is

commonly used for such purposes. The application acts as a marketplace as the name suggests in order to sell or purchase any digital or otherwise possession and transfer the complete ownership of it to the purchaser and have it logged on an immutable ledger that is blockchain, in this case which is Internet Computer. In order to increase the ease of usage, detailed guides and several other articles would be made available on the website for people more interested to know about the technology in detail.

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