

Impact of Non-Fungible Token on Digital Ownership

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Abstract: NFTs are tokens that we can use to represent ownership of unique items [6]. It is basically a proof of ownership of a digital asset. The word “Non-Fungible” in NFT means non-replaceable or ‘non-mutually-interchangeable’. The way an NFT works is that it gets uniquely stored in a blockchain and hence can’t be modified. This makes NFT a reliable certificate for digital assets. The copy of the original file is accessible to all and hence its copies can be publicly generated, but the NFTs are tracked on blockchains, such that the owner can obtain a proof of ownership other than the copyright itself.

Keywords — *Non-Fungible Tokens, NFT, Blockchain, Ethereum, Cryptocurrencies*

I. INTRODUCTION

On February 14, 2018, the Forever Rose undertaking offered a modernized image of a rose to a social occasion of 10 individuals for \$1 million paid in automated money. The plan was facilitated and enrolled on the Ethereum blockchain. The picture is directly open, anybody can duplicate it, store it on a hard-drive, however the affirmation of proprietorship related with it, can't. Essentially the 10 individuals from the social event can sell, annihilate, trade a huge load of possession the automated resource and no outcast is relied upon to deal with any of these exchanges. The Forever Rose undertaking is one of different potential outcomes given by the Cryptocollectibles improvement, a mechanical headway subject to utilizing blockchain advancement, a decentralized and trustless information accumulating show, to make excellent resources and pass on it to the workmanship business. [1]. We can define a Cryptocollectible as a “cryptographically unique, non-fungible digital asset”, which, simply put, means they are like art pieces stored on a blockchain, any form of data, (image, text, sound), that is uniquely identified by a blockchain. [2]

NFT or Non-Fungible Tokens have seen a drastic surge in the year 2021, as the artist Beeple sold a piece of digital art - ‘Everydays - The First 5000 Days’ for \$69 million [1] and Jack Dorsey (Twitter CEO) auctioned off his first ever tweet for \$2.9 million [3]. But NFT was around for a long time indicated by events such as Kevin McCoy minting an NFT called - “Quantum” in the year 2014[4], an American studio called Larva Labs developing Crypto Punks – 10,000 unique collectible characters traded through NFTs in the year 2017, which came with a proof of ownership stored on the Ethereum Blockchain.[5]

II. LITERATURE REVIEW

A. Background

Blockchain is a fairly new technology and first gained popularity as the protocol behind the cryptocurrency Bitcoin, which was introduced in 2009 at the peak of the financial crisis (Nakamoto, 2008; Zohar, 2015). The first and most popular blockchain protocol, that supports a virtual machine with which Turing complete scripting languages can be executed is Ethereum, which was first introduced in 2014. The motivation behind the creation of this new standard was that a crucial difference between fungible tokens and non-fungibility tokens exists. The term fungible refers to the interchangeability of each unit of a commodity with other units of the same commodity, i.e. two parties could swap the same amount without any gain or loss.

The first application based on NFTs to reach widespread adoption was a virtual online game called CryptoKitties. The game took up more than 70% of the transaction capacity of the Ethereum network at one point and the most expensive NFT that represents ownership of such a cat was sold for over USD 100,000 in late 2017. Thus, we treat NFTs as potentially valuable building blocks and utilize a specific use case to check if this assumption is valid and to gain theoretical and practical insight on usage, benefits and challenges.[10]

B. NFT explained

NFTs or Non-Fungible Tokens have metadata processed through a cryptographic hash function, an algorithm that computes a unique string of letters and numbers. It is a proof of proprietorship which is stored as an encrypted hash script. This hash script is uniquely generated and stored on

the Ethereum blockchain. NFTs are used to validate the authenticity of digital artworks. NFTs are also used to create the possibility of asset interoperability across multiple platforms [7].

NFTs help to assign ownership to the real owner of a digital artwork or file. Digital files can be easily duplicated over the internet. Hence, any artwork/file could be accessed and duplicated from anywhere, although the authenticity of the file/artwork can be confirmed using Non-Fungible Tokens [7].

C. Security

An Non-Fungible Token system in an amalgamation of technology which comprehends blockchain, storage and web applications.

It is a challenge to perform a security assessment on NFT systems; each module may become an attacking interface that makes the whole system penetrable against the person who is performing the attack.

i. Authentication.

If anyone gets access to the user's credentials, they might be able to transfer the NFT to another account and thus steal the NFT. It would be difficult for the original owner to claim back the NFT again as the contract would already be transferred to another user. This scenario mainly depends upon the Security policies of the marketplace where NFT is stored [11].

ii. Unavailability of Service

Even though a user might own the NFT, the actual NFT is stored at the marketplace. A user is only accessing the NFT through the marketplace and even after the contract is transferred to the new user the NFT stays with the marketplace.

If a market place shuts down or denies the users access, users will have no way of accessing or trading the NFT and would lose the NFT [11].

iii. Token Standards

NFTs can represent many different types of collectables such as audio, video, images etc. so it is important that the tokens in the marketplace are following certain Standards. There are multiple standards available in the market namely ERC-721, ERC-1155 and ERC-998. These standards are mainly used by Ethereum for NFT development. ERC-721 is the first NFT standard which was developed in 2018 while ERC-998 is an extension of ERC-721 standard. ERC-1155 is also a popular Token standard which was created by Enjin [12].

Table 1: Difference between fungible and non-fungible tokens

Fungible tokens	Non-fungible tokens
<p>Interchangeable</p> <p>A token can be exchanged for any other token of the same type e.g. a dollar bill may be exchanged with another dollar bill with no effect to the holder.</p>	<p>Not interchangeable</p> <p>A Non-fungible token cannot be replaced with another non-fungible token of the same type e.g. a nonfungible token is akin to a birth certificate it cannot be exchanged with another individual's birth certificate.</p>
<p>Uniform</p> <p>All tokens of the same type are identical in specification, each token is identical to another</p>	<p>Unique</p> <p>Each token is unique and different to all other tokens of the same type.</p>
<p>Divisible</p> <p>Fungible tokens are divisible into smaller units and it doesn't matter which units one obtains as long as the value is the same.</p>	<p>Non-divisible</p> <p>Non-fungible tokens cannot be divided. The elementary unit is one token and one token only.</p>

A crypto collectable is non-fungible, a cryptographically unique, non-replicable digital asset (Hobbs, 2018). NFT's are unique and distinguishable tokens, mostly implemented on (but not limited) to the Ethereum Blockchain utilizing the ERC-721 standard which have individual traits and identities. It is NFT's trustless nature and scarcity that is their unique selling point and an attractive reason for their ownership (Pelnik, 2018). Table 1. presents the differences between fungible and non-fungible tokens. One interesting characteristic of NFTs is extensibility, which is the ability for one NFT to be extended with another NFT, creating a completely new NFT. This feature allows, for example, a NFT-based wildlife character to breed and create a new NFT-based wildlife character while retaining the properties of a NFT.

III. METHODOLOGY

To look at the growth of the NFT marketplace, we need to perform some analysis on the available data. The data source on which this research is based is "nonfungible.com". Nonfungible.com is the world's largest NFT data resource [8].



Figure 1: Number of sales Nov-2017 -Oct 2021

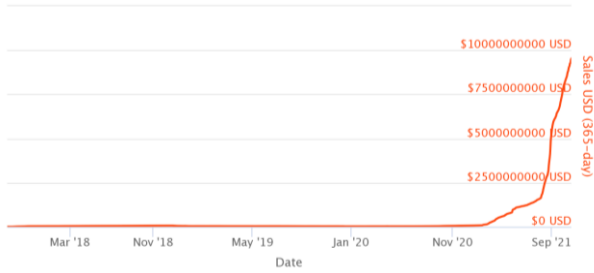


Figure 2: Sales in USD Nov-2017 -Oct 2021

The figure 1 and figure 2 represent the graphical representation of Total number of sales on each day and Total amount spent on each day(in USD) on NFT from November 2107. In this research we would mainly focus from November 2017 to October 2021. The time span was specifically chosen as we see significant growth in terms of the total number of NFT purchased every day.

Further from the figure 2 we can see the total amount spent on NFT each day saw an exponential growth on January 2021 which could be the result of sales of NFT 'Everydays - The First 5000 Days' by Beeple [1] and First tweet by Jack Dorsey (Twitter CEO), [3] which played a huge role in Introduction NFT market to people on large scale.

Along with a few Aforementioned sales events one of the major contributing factors of rise in Digital Markets and Auctioning could be the pandemic and lockdown [9] which made it Impossible for auctioning of physical form of arts like paintings, sculptures, Music CDs etc.

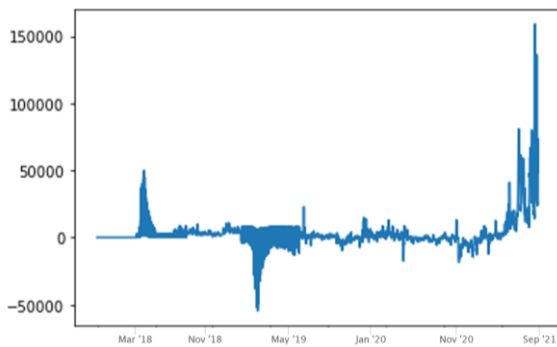


Figure 3: Difference between the total number of sales made on a given day and day before.

The figure 3 represents the graphical representation of the difference between the total number of sales made on a given day and day before. At any point on the graph, we can see by how much there was an increase or decrease in the number of sales made with respect to the previous day. According to the graph we can see the sales frequently spiked below 0 but after December 2020 - January 2021 we can see the number is constantly above 0 and climbing rapidly. This indicated at any given day after January 2021 we are mostly likely to see total number of sales increased rather than decrease.

By further analysis we can find that on an average we see an increase in no of sales by 2915 sales everyday which is 0.634% of increase.

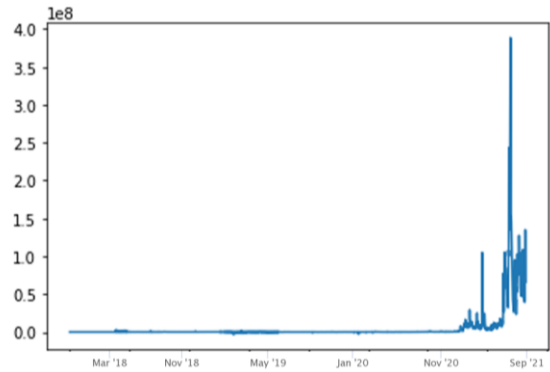


Figure 4: Difference in USD spent on particular day with respect to previous day.

The figure 4 represents the graphical representation of the difference between the Total USD spent on completed sales on a given day and day before. At any point on the graph, we can see by how much there was an increase or decrease in the USD spent with respect to the previous day.

Here also we can see the graph is mostly flat till January 2021, but after that we see huge spikes in the difference of USD spent each day with respect to the previous day. Also, we cannot that the graph is constantly above 0 after January 2021 which would indicate that it is more likely that sales in terms of dollars have increased.

By further analysis we can find that on an average we see an increase in USD spent by 4976646\$ everyday which is 0.78% of increase everyday with respect to the previous day.

Table 2: Analysis Outcome

Average increase on a day with respect to previous day	Number of sales Nov-2017 -Oct 2021	Sales in USD Nov-2017 -Oct 2021
In Percent	0.634%	0.78%
In Value	2915 Nos	4976646\$

A. Applications of NFT in day-to-day world.

i. Event Ticketing.

NFTs can be used to uniquely allocate seats in any event by tokenizing seating allocations. Due to the unique characteristic of NFT which doesn't allow duplication, seat allocation can be done uniquely. [13]

ii. In-Game Items.

In games Items like player costumes, skins, weapons and so forth can Tokenized using NFT. This can help players to trade items in game and all items can attain they uniqueness. [14]

iii. Legal Documents

Any legal property document can be converted into an NFT. It can help in identifying the actual owner. This will reduce the scams in real estate and ease the selling process.

IV. CONCLUSION

In this paper, we presented the idea of NFT's growth as a new form of collectability in the Market. The concept and history behind the NFT and NFT market and how it is gaining importance in the already established collectables market. The NFT can be created for any form of digital asset like Music, images, videos etc. easily and securely transfer the ownership from one person to another. This ease of creation and transfer can be one of the many reasons for the growth of NFT. We performed various analyses on publicly available data to further prove that there is steady increase in both the number of NFT purchased and also the amount spent on those NFT's. We can also see pandemic and lockdown from mid-2020 as one of the prominent factors in the increase in digital Collectable markets like NFTs to gain rise in popularity and value. After factoring all the data and analysis performed on it, we can conclude in this paper that NFTs are going to be a major contributor in the field of collectables market in coming years and would add a new form of collectables for which would be easy to transfer and secure to store.

REFERENCES

- [1] Christie's Beeple's opus, https://www.christies.com/features/Monumental-collage-by-Beeple-is-first-purely-digital-artwork-NFT-to-come-to-auction-11510-7.aspx?sc_lang=en
- [2] Henrique Centieiro's, Unblockchain: A Brain-Friendly Guide for Blockchain, from Bitcoin to Ethereum Deep-Dive.
- [3] Valuables, <https://v.cent.co/tweet/20>.
- [4] Yahoo news, <https://news.yahoo.com/exclusive-first-ever-nft-2014-163940646.html>.
- [5] Daily Art Magazine's, What Is NFT and Why Is It Shaking Up the Art World. <https://www.dailyartmagazine.com/nft-art/>.
- [6] Ethereum, <https://ethereum.org/en/nft/>.
- [7] Sanction Scanner's, What is a Non-Fungible Token (NFT)? <https://sanctionscanner.com/blog/what-is-a-non-fungible-token-nft-375>.
- [8] Nonfungible, <https://nonfungible.com/>
- [9] World Health Organization, <https://covid19.who.int/>.
- [10] Ferdinand Regner, André Schweizer, Nils Urbach (2019), NFTs in Practice–Non-Fungible Tokens as Core

Component of a Blockchain-based Event Ticketing Application (1-17)

- [11] Qin Wang, Rujia Li, Qi Wang, Shiping Chen (2021), Non-Fungible Token (NFT): Overview, Evaluation, Opportunities and Challenges (9-11)
- [12] An In-depth Insight into ERC-721 and Other NFT Standards, <https://www.antiersolutions.com/an-in-depth-insight-int-o-erc-721-and-other-nft-standards/>
- [13] Ferdinand Regner , André Schweizer , Nils Urbach (2019), NFTs in Practice – Non-Fungible Tokens as Core Component of a Blockchain-based Event Ticketing Application
- [14] Matthieu Nadini, Laura Alessandretti, Flavio Di Giacinto, Mauro Martino, Luca Maria Aiello, Andrea Baronchelli (2021) , Mapping the NFT revolution: market trends, trade networks, and visual features