OARJ OPEN ACCESS RESEARCH JOURNALS

(RESEARCH ARTICLE)

Check for updates

Smart collectibles; use case of NFT tokens

Sina Osivand *

Group management of TOBTC, Iran.

Abstract

Non-Fungible Tokens (NFTs) have garnered remarkable investor attention recently, with some NFTs securing selling prices that may have seemed unthinkable for a non-fungible virtual asset. This raises fascinating questions about "value" and "scarcity" with respect to blockchain technology, through a prism of non-fungibility of a digital asset, and this paper aims to draw attention to these questions insofar as they may shape an alternative space of blockchain development and exchange going forward. We find that NFT submarkets are cointegrated and feature various causal short-run connections between them. The success or adoption of younger NFT projects is influenced by that of more established markets. At the same time, the success of newer markets has an impact on the more established projects. The results contribute to the overall understanding of the NFT phenomenon and suggest that NFT markets are immature or even inefficient. This article will tackle these questions from a UK perspective, specifically looking at cases from England and Wales and Scotland, while also covering a few relevant CJEU decisions. This is a relatively recent technology, which will require a lengthier technical explanation to analyse the legal issues that are raised. In some instances, the public perception will be dealt with as well, as it has become evident that there is considerable misunderstanding not only about what an NFT really is, but about the ownership and copyright issues that surround the technology. While NFTs are not entirely related to copyright, and in some way they're trying to bypass legal transactions in favour of technical solutions, this paper will concentrate on the copyright questions, but it will also tackle some of the emerging issues about the technology. A quick note about balance. This work will take a generally neutral approach to the study of NFTs, but this is a subject that is not devoid of controversy. There have been concerns raised about the viability of this model from various perspectives, but it is not the remit of the work to tackle these, and the approach will be to view non-fungible tokens at face value. The concerns range from the environmental cost of running blockchain technology,9 to the use of tokens for money laundering,10 to the existence of often crippling transaction fees that could make it difficult for artists to profit from their work.11 It is important to highlight these here, although they will not be the subject of further analysis.

Keywords: Develop; Copyright; Marketplace; NFT tokens

1. Introduction

The same blockchain technology used to mint5 and trade NFT-based art can be used to create NFTs6 that act as unique digital keys7. These NFT keys, called 'Smart Collectibles,' can unlock access to almost anything - including services, experiences, and digital or physical products. Because Smart Collectibles are stored on the blockchain and held in a digital wallet, they provide creators and owners more control over the use of their data and goods.

2. Use Cases of Non-Fungible Token

Over the course of time, there have been many speculations about the blockchain applications of non-fungible token. However, the truth about NFTs is that they can showcase the proof of actual ownership of specific assets on blockchain.

---

* Corresponding author: Sina Osivand
Group management of TOBTC, Iran.

NFTs can hold, deny or restrict the rights of individuals on specific assets, thereby ensuring exclusivity for the owner. So, NFTs have a long road ahead in their future, and their applications would increase in the future. However, NFTs are also considered beneficial in a wide variety of enterprise blockchain use cases in the present times. Their abilities for easier verification of originality and scarcity of information on digital platforms are not something that you should take lightly. With that being said, let us take an in-depth look at the different non-fungible token use cases as follows,

2.1. Art

The recent news of digital artist, Beeple, selling an NFT of his artwork at a whopping $69 million at Christie's auction, created ripples throughout the blockchain world. The record-breaking NFT sale came after a series of increasingly valuable auctions. Beeple sold his first series of NFTs in October, with a pair priced at $66,666.66 each. Subsequently, he sold a series of his works for around $3.5 million in total. The 255-year old auction house, Christie, presents a legitimate value for Beeple's art as well as NFT as a technology. Programmable art is the most common non-fungible token use cases, bringing in the perfect mix of creativity and technology. Presently, you can find various limited edition artwork pieces in circulation. Interestingly, they allow the flexibility for programmability for modifications in different circumstances. The use of smart contracts & oracles can enable artists for developing images capable of responding to fluctuations in pricing of blockchain-based digital assets. Subsequently, the use cases of non-fungible token could appeal to the domain of legacy arts through tokenization of real-world assets and different works of art. With the combined power of blockchain and IoT, people could just scan a code on the tag attached to an artwork and register their ownership of the artwork on blockchain. Subsequently, users could view the entire history of the artwork, including the previous prices at which it was purchased and ownerships.

2.2. Fashion

Blockchain has been able to meld seamlessly in the world of fashion with the assurance of advantages to all supply chain participants. Consumers could easily verify the ownership information of their items and accessories digitally, thereby reducing the risks of counterfeiting frauds. Users could just scan a simple QR code on the price tags with apparel and accessories that is in the form of an NFT. Therefore, consumers could get a clear impression of details such as place where the asset was created. In addition, consumers could know details of the people who held ownership of the asset before the customer purchased the asset. The introduction of blockchain in the world of fashion has played a crucial role in reduction of carbon dioxide emissions. As a result, they can increase employee welfare alongside protecting customers. Therefore, NFT can create a new type of blockchain for supply chain in the fashion industry.

2.3. Gaming

The gaming world is perhaps one of the industries that stand to benefit the most from NFTs. NFTs can be used to create non-duplicable in-game items enabling gamers to have a form of ownership like never before. An example could be a game where players collect virtual non-fungible in-game coins as they progress through the game's levels. After they have accomplished the most coveted goals, they can choose to sell the in-game coins they gathered for a profit as they have full ownership of those virtual coins.

2.4. Licenses and Certifications

NFT use cases can also lend profound benefits for verifying licensing and certifications. Course completion certificates, such as any other degree or license, are generally offered to successful candidates in digital form or in paper-based form. Universities and employers require replicas of the course completion document as references before they offer a position to someone in a company or an institute.

Admins could save a lot of time by accessing such licenses with the functionalities of NFTs. Certificates and licenses in the form of NFTs take away the burden of record checking and verification. Subsequently, the approach also delivers an easier approach for storing evidence of course completion or licensing.

2.5. Collectibles

Collectibles are also one of the profound entries among use cases of non-fungible token. As a matter of fact, online collectibles such as Cryptokitties were one of the initial ways in which people learned about the use of NFTs. The popularity of Cryptokitties gained prominence in 2017 as they congested the Ethereum network. They are basically unique digital kittens that users can breed for making for unique kittens. Each crypto kitty features specific traits such as fur pattern or eye color, making them more appealing than others. Users can purchase two different cats, a Sire, and a Dame, for breeding them by simply clicking on a button. The resulting new kitten features its own identity and Genetic

Algorithm or GA. The scarcity of genetic makeup determines the value of crypto kitties. In addition, the number of times of using a Sire for breeding other kittens also plays a crucial role in determining the value of crypto kitties.

2.6. Sports

Counterfeit tickets and merchandise are some of the critical issues plaguing the sports industry. Blockchain is serving as the perfect alternatives for resolving such issues without any complications. The immutable nature of blockchain technology helps in preventing the issue of counterfeit collectibles and tickets. The example of tokenized sports game tickets issued on blockchain shows how NFT use cases can benefit the sports industry. Every ticket is similar, and all of them feature data that is unique to registered owners of the ticket on blockchain. Sport NFTs are also turning into a trend, with many tokenization of successful athletes on the blockchain. The value of the tokens representing successful athletes depends on their performance.

2.7. Ticket

Non-fungible tokens are also useful in the ticketing industry. NFTs on the blockchain can be used to represent tickets in a sports event or a concert. This ensures that every attendee has original access and any ticket reproduction is tracked and prevented.

2.8. Real Estate

In the real estate industry, physical land or property can be represented on a blockchain as an NFT. This means that the digital token representing a piece of land can have all sorts of attributes such as location, price, and measurements. Thanks to blockchain, it would be impossible for malicious actors to tamper with land ownership and other physical assets associated with the land.

3. What Are Smart Collectibles?

We define Smart Collectibles as NFTs that unlock access to unique value held off the blockchain. In the simplest sense, a Smart Collectible is a unique piece of code you hold in a digital wallet and use as an access token for something of value. As NFTs, the Smart Collectible code is created on the blockchain8, which means each Smart Collectible is unique, secure, and easy to sell or transfer to another user.

	Physical Key	Digital Password	Smart Collectible
Accessing Value	One physical location	One or more digital accounts	Physical & digital value (no limit)
Value Creation	Can fit and open one or more locks	Value typically only added by the company that issues the accounts	Value can be added without limit by both the creator and others
Security	Can be stolen or copied	Can be stolen, guessed, or forgotten	Nearly impossible to tamper with
Selling	Selling compromises security (key/locks must be changed after the sale)	Selling compromises security (password must be changed after account sold)	Selling on liquid markets is easy and secure. Access automatically transfers to the new owner after sale.
Ownership	Requires verification From third-party	Requires verification From third-party	Ownership information stored on the publicly verifiable ledger (blockchain)

Figure 1 Comparing Smart Collectibles with Physical Keys and Digital Passwords

Because they unlock value, Smart Collectibles invite comparisons with physical keys and digital passwords, but they can do much more. In comparison to these, Smart Collectibles have many improvements and benefits: they are more secure, have many more uses, can each be used to enable access to multiple pieces of value, and much more: A physical key (e.g. a house key) allows you to unlock one specific lock. Typically this means you can access value in one physical location (such as a house). Because the key can be stolen or copied, allowing access to multiple locations increases risk.

Additionally, if the value (the house) is sold, security can only be assured by changing the keys and locks, because there is no way of knowing whether a previous owner made a copy of the key or not. Owning the key is not enough to prove ownership of the value, so third-party verification is essential. A digital password allows you to access one specific digital account (in most cases). The value that that account provides is controlled by the organization that issues it. Passwords can be reused for multiple accounts, but this substantially increases the risk if the password is stolen, guessed, or forgotten. In some cases, an account can be used to access additional value (for example, logging in to another service using your Facebook credentials). Selling is impractical and compromises security (passwords must be changed after the account is sold), and is not typically done. In comparison to these, Smart Collectibles have many improvements and benefits. Each Smart Collectible has the potential to unlock access to many types of value, and this value can be added without limit by both the creator of the token and others. Because the Smart Collectible is made on the blockchain, it is nearly impossible to tamper with. Selling a Smart Collectible is easy and secure; NFT standards and marketplaces mean they can be bought and sold freely in a liquid market. Access automatically transfers to the new owner after a sale, and because the information is stored on a publicly verifiable ledger (the blockchain), there is no need for third-party verification.

4. Use Case: Event Ticketing

4.1. Creation

Each unique ticket is a Smart Collectible, which when sold is transferred to the purchaser's digital wallet9. The owner of that wallet is then given access to the event by proving their ticket ownership using an NFC-enabled device, like a smartphone. Because the Smart Collectible 'ticket' is held on the blockchain, it is nearly impossible to tamper with it.
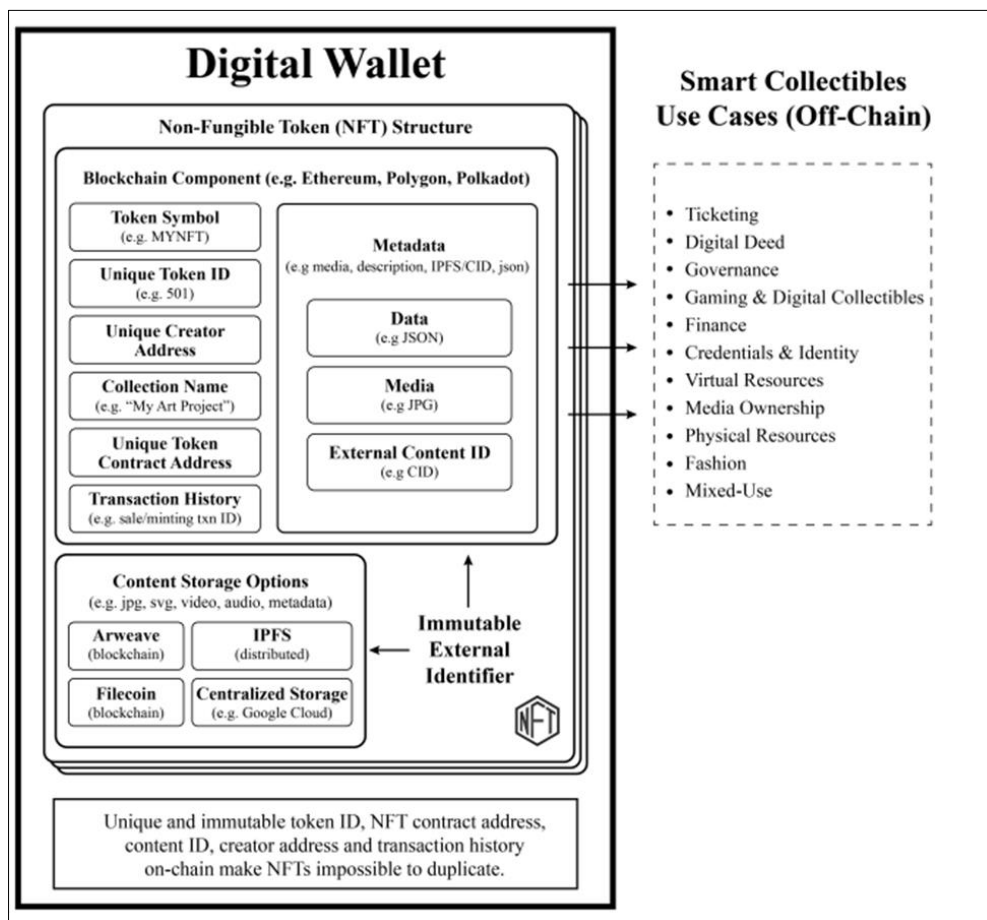
4.2. Added Value

Figure 2 Unlocking Off-Chain Functionality with Smart Collectibles

After the event, the event organizer adds value to the Smart Collectible by enabling the owner to access an exclusive video of the concert. They also allow ticket holders access to exclusive discounts for an online store where they can

purchase merchandise related tothe event. The creator can stack any amount of value on the same Smart Collectible. This does not need to be added all at once; creators can continue to add value to a Smart Collectible indefinitely. **Sale:** Over time, the band who gave the concert grows in fame, and the Smart Collectible ticket continues to accrue value due to the unique bonuses it enables access to and as a collectible item itself. The holder decides they want to sell it and lists it on a popular NFT marketplace, enabling collectors to bid for it in an auction. After a competitive auction, the ticket and its associated benefits sell as a collector's item for the equivalent of $1,000.

As you can see from Figure 2, when creators begin to use NFTs to provide access to more value than can be held in metadata, a plethora of functionality is unlocked. When creators make NFTs like this (which we categorize as Smart Collectibles), they access many benefits:

- Create and sell secure digital 'keys' for accessing almost any type of value
- Mix different types of value on the same Smart Collectible, enabling them to create unique value propositions tailored to their customer's needs and business model.
- Add additional value after creating it, perhaps months or even years later
- Include code in the metadata so that they automatically receive a percentage of the sale price when the Smart Collectible is resold on a secondary market
- Add value to Smart Collectibles made by other creators For Smart Collectible owners, this enables them to:
- Securely purchase assets that continue to accrue value
- Benefit from multiple forms of value through just one Smart Collectible
- Easily access the value by having all their Smart Collectibles in their digital wallet without having to remember multiple usernames and passwords
- Securely sell or trade their Smart Collectibles whenever they wish

4.3. Smart Collectibles Use Cases

Smart Collectibles enable creators to limit access to digital or physical items or functionality securely, and as such, have a wide range of use cases. In addition to the ticketing and events example above, use cases are detailed below and illustrated in Figure 3.
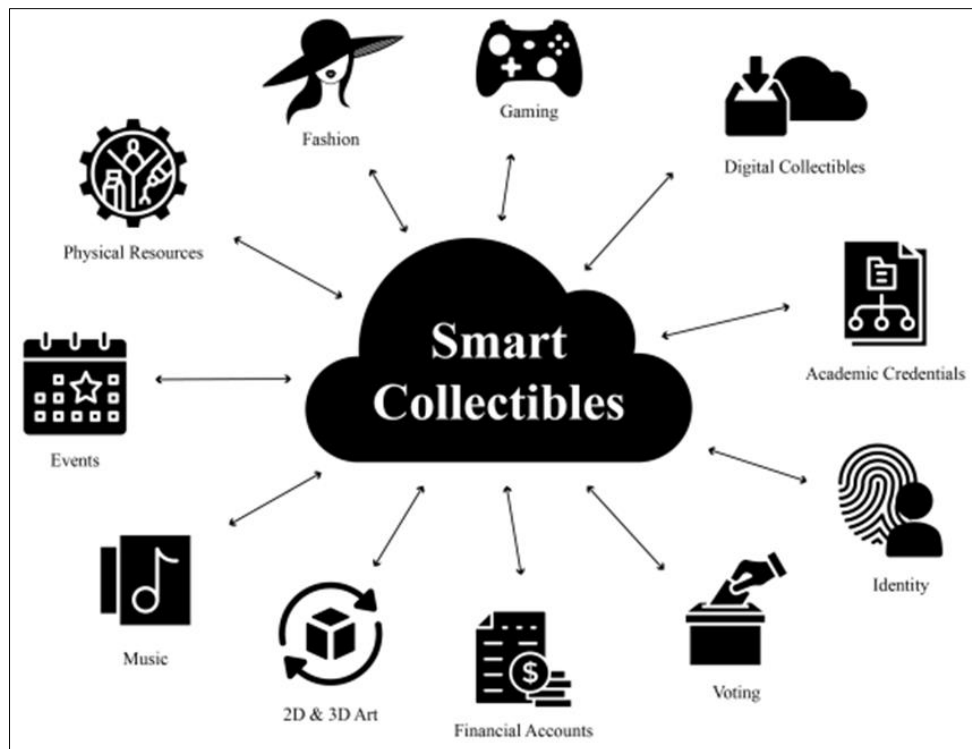

Figure 3 Smart Collectible Use Cases

5. Gaming & Digital Collectibles

Collect, use and sell unique digital collectibles that enable users to access unique gameplay or abilities within one or many games. These include digital Collectible Card Games (CCGs) and unique items and resources (weapons, apparel, items) in online multiplayer games. A single Smart Collectible could unlock access in one or many games. For example, a publisher may enable one collectible to unlock the same clothing style in multiple games, enabling users to better define their own digital identity.

5.1. Finance

A Smart Collectible can be assigned rights or deeds to dividends, securities, properties, businesses, and more. Furthermore, Smart Collectibles can be used to reassign value. For example, a Smart Collectible can be assigned as a beneficiary in a will, enabling someone to pass on their estate to sanother person, or multiple persons in the case of multiple NFT owners.

5.2. Credentials & Identity

A Smart Collectible could be used as a unique and secure method of authenticating a person's identity or other credentials and using that information to enable or disable access to specific resources or actions. In this case, the Smart Collectible would not be tradable to prevent identity fraud. Potential uses include voting, identity cards, and access to financial accounts. One project working on this is IdToken.

5.3. Voting

Each voting token (smart collectible) enables the owner to take a vote. Depending on the setup, owners may be able to own multiple voting tokens or just one, and tokens may be tradable or non-tradable. In some cases, users may assign their voting rights to another individual to enable them to vote on their behalf (while still retaining ownership of their Smart Collectible). Many DAOs currently use ERC-20 tokens (cryptocurrencies) as voting tokens, enabling people to vote according to how many tokens they hold and to split their vote if they wish (quadratic voting). Smart Collectibles can be used similarly but could also enable other voting options. For example, rarer Smart Collectibles may offer a greater voting weight (more votes) than more common ones.

5.4. Decentralized Autonomous Organizations (DAOs)

A Decentralized Autonomous Organization (DAO) is a fully-decentralized organization that runs autonomously according to the rules coded into it when created. Instead of having a CEO or board of directors, the DAO is managed by the owners of its associated tokens, which enable them to have voting rights on what actions the organization takes next.

5.5. Virtual Resources

Smart Collectibles are an easier-to-use, more secure alternative to passwords. Instead of requiring multiple secure passwords for different websites, users sign in with their digital wallets. This digital wallet can hold one or many Smart Collectibles that enable the user access to their online accounts. Projects such as Sequence and Rainbow Wallet are already making this a reality. Many online users use their Facebook or Google accounts to achieve a similar result; however, relying on these third-parties creates significant privacy concerns. Smart Collectibles offer a cryptographically-secure alternative that protects the user's privacy.

5.6. Media Ownership

NFT-art is just the tip of the iceberg. Smart Collectibles can be used to provide functionality for owners of art, music, 3d work, and even text-based work. Owners will be able to create virtual galleries of their media for friends to look at.

5.7. Physical Resources

Using an NFC-enabled13 device, such as a smartphone, Smart Collectibles can enable access to physical resources (and prevent unauthorized users from accessing). For example, a manufacturer may use Smart Collectibles to allow employees to access and use specific machinery. This could be combined with credentials to ensure employees only use equipment they have been trained to use, or other functionality to prevent use outside of work hours.

5.8. Fashion

Smart Collectibles would enable high-end fashion retailers and end-users to authenticate genuine products and prevent counterfeiting by linking each unique piece with a Smart Collectible. Users will authenticate each piece, check ownership history, access care guides, and more. In practice, this is difficult to achieve since it is possible to sell the physical asset without updating the token record. One solution is to provide a centralized authentication service that manages the transferable of ownership, holding the product and fee in escrow until the token record has been updated.

5.9. Mixed-Use

One of the most significant benefits of using Smart Collectibles is that multiple different use cases can be implemented on a single Smart Collectible. This provides creators, communities, and businesses with nearly unlimited opportunities to build value for their followers and customers.

6. How Do Smart Collectibles Work?

Smart Collectibles are a type of token stored on the blockchain. It is the underlying blockchain technology, along with the code that makes up the token, that provides Smart Collectibles with the benefits that set them apart from other ways to access value. Let's break it down: A blockchain is a decentralized ledger, which means that the transaction history (who owns what) is stored on many nodes14. This differs from traditional centralized ledgers, where there is a single copy of the data held on a central node. Because there are many copies, it is nearly impossible to lose or tamper with the data. See Figure 4.
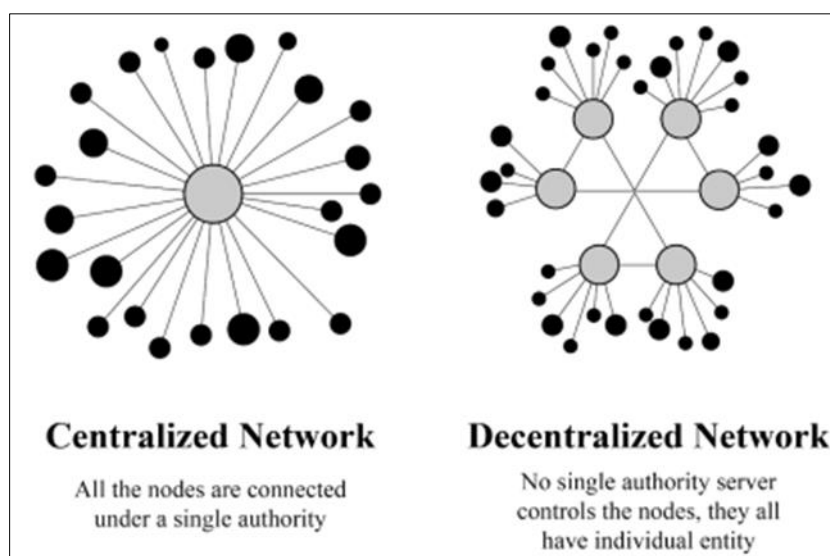

Figure 4 Centralized and Decentralized Network Models

The Bitcoin blockchain, for example, tracks transactions of Bitcoin, a fungible16 digital cryptocurrency that can be used as a store of value and to purchase goods and services. These cryptocurrencies are not Smart Collectibles.

These tokens are created using set standards that govern how they can be used. Tokens created using the ERC-20 standard are fungible and can be used as currencies, while the ERC-721 standard is used to mint Non-Fungible Tokens (NFTs). The ERC-721 standard ensures that every NFT has functionality such as transferability and that every NFT is unique. The uniqueness of the NFT enables the creation of Smart Collectibles: each NFT has a unique tokenID that a decentralized app (dApp) can use as an input to unlock access to any type of value. A newer standard, ERC-1155, can be used to create both fungibles, like currencies, and non-fungibles, like NFTs and Smart Collectibles.

7. Smart Collectibles vs. NFTs

All Smart Collectibles are NFTs, and because of this, they have the same properties as NFTs - they are non-fungible, have a traceable owner, and are tradable. The only difference is that we classify NFTs used to unlock access to further value held off the blockchain as Smart Collectibles. It's important to note that not all NFTs are Smart Collectibles, but all NFTs

have the potential to be classified as Smart Collectibles. If, at any time, the owner of an NFT (or anyone else) decides to link access to additional unique value to the ownership of that NFT, it can become a Smart Collectible. Many NFTs currently sold do not offer access to unique value off the blockchain - they are not Smart Collectibles - but this may not be true in the future. It is likely that as the adoption of Smart Collectibles continues, more NFT creators and owners will want to add additional value.

7.1. Are Bitcoins Smart Collectibles?

Fungible tokens, such as Bitcoins, are not Smart Collectibles. They hold value that can be realized by exchanging them for goods or services or transferred by exchanging them to fiat or another cryptocurrency. However, it is conceivable that these fungible tokens can act similarly. For example, a company might offer high net-worth Bitcoin holders certain advantages, such as access to a private members lounge or other benefits. In this scenario, Bitcoin acts as a smart collectible by unlocking access to value simply by being held.

8. Conclusion

The possibilities offered by Smart Collectibles are nearly endless, but to see these become a reality, we need to see improvements in three areas: Innovation - Businesses, communities, and creators must innovate in their use of NFTs, stacking value to create true Smart Collectibles. This functionality is available already, but is so far under-utilized. With the NFT ecosystem still at an early stage, there is a massive opportunity for businesses, communities, and creators to claim the advantage of being among the first to realize the true potential of this technology. Participation - To encourage innovation, users must reward projects that seek to deliver more value than just metadata. Look out for creators, communities, and businesses that are stacking value and support them by purchasing their NFTs in favor of those who provide little value. Interoperability - To achieve the true potential of the Metaverse, there must also be a solution for building interoperability between the multiple platforms that currently allow for the creation of Smart Collectibles, so that users can seamlessly transfer NFTs anywhere, providing vital liquidity for the system. Regardless of whether you are a user, creator, or business, this is an exciting time to be learning about NFTs and Smart Collectibles. Below, we've provided several further reading suggestions that you may wish to check out.

References

[1]   Ethereum.org, Non-fungible Tokens (NFT), https://ethereum.org/en/nft/.

[2]   Ethereum, EIP-721, https://github.com/ethereum/EIPs/blob/master/EIPS/eip-721.md.

[3]   Ethereum, ERC-1155 Reference Implementation, https://github.com/enjin/erc-1155.

[4]   Satoshi Nakamoto, Bitcoin: A Peer-to-Peer Electronic Cash System, https://bitcoin.org/bitcoin.pdf.

[5]   Nick Szabo, Smart Contracts: Building Blocks for Digital Markets, https://www.fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vwh.net/smart contracts 2.html.

[6]   Packy McCormick, The Value Chain of the Open Metaverse, https://www.notboring.co/p/the-value-chain-of-the-open-metaverse.

[7]   Piers Kicks, Into The Void: Where Crypto Meets The Metaverse, https://metaversed.net/Into-The-Void-Where-Crypto-Meets-The-Metaverse-263f1ff8c13c455ea472f5689e01acaa.

[8]   Shermin Voshmgir, Tokenized Networks: Web3, the Stateful Web, https://blockchainhub.net/web3-decentralized-web/.

[9]   Edoardo Talamo & Alma Pennacchi, IdToken: the new decentralized approach to digital identity, https://dblp.org/rec/conf/openidentity/TalamoP20.