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NFT in art business: real opportunity or short-term novelty? A theoretical approach

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ABSTRACT

In recent years the blockchain and the digital innovation has caused paradigm shifts across very disparate sectors of our society (Rangone & Busolli, 2021). In such a context, the non-fungible tokens (NFT) more specifically have started to transform everything from finance to art (Kashevarova & Starikova, 2022; Qin *et al*., 2021). There's good reason to suspect that, once their full potential is realized, almost no industry will be left untouched. Although the technology has been around for a while, NFTs took off in 2020 and have been growing in popularity ever since, particularly in the digital art world (Habrel, 2022; Dragos Popescu, 2021; Trautman, 2021). In that year, the rapid growth of the NFT sector and its numerous mentions in mainstream media surprised many in the crypto space. In 2021, many NFTs from the most popular NFT collections, such as crypto kittens, crypto punks, and "Decentraland" land plots, were sold for insanely high prices. According to DappRadar (2021), a service that records the buying and selling of NFTs, the trading volume of NFTs reached a record high of $22 billion in 2021. This success can be attributed to mainstream businesses entering the NFT industry. As today's hottest digital assets, non-fungible tokens have taken the arts and investment worlds by storm. Some claim that NFTs are the future of artwork and that the next Vincent van Gogh will be a computer programmer. Many see NFTs as viable, profitable investments tailored for younger, digitally savvy buyers. Detractors wonder if NFTs are a short-term novelty. Through a theoretical approach, this paper investigates the scenarios and the possible criticalities of the NFTs' spread in the specific sector of art business.

Negli ultimi anni la blockchain e l'innovazione digitale hanno prodotto cambiamenti di paradigma in settori molto disparati della nostra società (Rangone & Busolli, 2021). In tale contesto, i token non fungibili (NFT), più nello specifico, hanno iniziato a trasformare ogni aspetto, dalla finanza all'arte (Kashevarova & Starikova, 2022; Qin *et al.*, 2021). Ci sono buone ragioni per sospettare che, una volta realizzato il loro pieno potenziale, quasi nessun settore sarà lasciato indenne. Sebbene la tecnologia sia in circolazione da un po' di tempo, gli NFT sono decollati nel 2020 e da allora sono cresciuti in popolarità, in particolare nel mondo dell'arte digitale (Habrel, 2022; Dragos Popescu, 2021; Trautman, 2021). In quell'anno, la rapida crescita del settore NFT e le sue numerose menzioni nei media mainstream hanno sorpreso molti nello crypto-spazio. Nel 2021, molti NFT delle collezioni NFT più popolari, come gattini crypto, crypto punk e appezzamenti di terreno Decentraland, sono stati venduti a prezzi follemente alti. Secondo DappRadar (2021), un servizio che registra l'acquisto e la vendita di NFT, il volume degli scambi di NFT ha raggiunto il livello record di 22 miliardi di dollari nel 2021. Questo successo può essere attribuito alle aziende tradizionali che entrano nel settore degli NFT. Essendo gli asset digitali più in voga al momento, i token non fungibili hanno preso d'assalto il mondo dell'arte e degli investimenti. Alcuni sostengono che gli NFT siano il futuro delle opere d'arte e che il prossimo Vincent van Gogh sarà un programmatore di computer. Molti vedono gli NFT come investimenti validi e redditizi su misura per gli acquirenti più giovani ed esperti di digitale. I detrattori si chiedono se gli NFT siano una novità a breve termine. Attraverso un approccio teorico, questo articolo indaga gli scenari e le possibili criticità della diffusione degli NFT nello specifico settore dell'art business.

Keywords: Innovation; NFT; Digital Business; Art Business, Transactions

1 – Introduction

In recent years, new technologies and digital innovation have caused paradigm shifts across very disparate sectors of our society (Rangone & Busolli, 2021). In such a context, the non-fungible tokens (NFT) more specifically have started to transform everything from finance to art (Kashevarova & Starikova, 2022; Qin *et al*., 2021).

There's good reason to suspect that, once their full potential is realized, almost no industry will be left untouched.

Although the technology has been around for a while, NFTs took off in 2020 and have been growing in popularity ever since, particularly in the digital art world (Habrel, 2022; Dragos Popescu, 2021; Trautman, 2021). In that year, the rapid growth of the NFT sector and its numerous mentions in mainstream media surprised many in the crypto space.

In 2021, many NFTs from the most popular NFT collections, such as crypto kittens, crypto punks, and Decentraland land plots, were sold for insanely high prices.

It's impossible not to have heard about NFTs. As today's hottest digital assets, non-fungible tokens (NFTs) have taken the arts and investment worlds by storm (Ravikiran, 2023).

As reported by Eckler (2021): "some claim that NFTs are the future of artwork and that the next Vincent van Gogh will be a computer programmer. Many see NFTs as viable, profitable investments tailored for younger, digitally savvy buyers. Detractors wonder if NFTs are a short-term novelty".

1.1 – *What is an NFT and how it works*

In the world of blockchain and cryptocurrencies, a valuable digital collectible is making its way: non-fungible tokens, or NFTs. The name reveals its most important feature: these digital tokens found in a blockchain are "non-fungible" (Clark, 2022).

A non-fungible token (NFT) is a unit of data that lives on a blockchain. Each NFT has a unique identification code that can't be replicated or copied and metadata that can be linked to a variety of things to provide immutable proof of ownership. For example, the metadata an NFT contains can be tied to digital images, songs, videos, or avatars. It can also be linked to physical items, like cars and yachts, or used to give an NFT owner access to exclusive merchandise, tickets to live or digital events, or other exclusive perks (Sharma, 2023).

An NFT is a digital asset that represents real-world objects like art, music, in-game items and videos. They are bought and sold online, frequently with cryptocurrency, and they are generally encoded with the same underlying software as many cryptos (Conti, 2023).

For Maddula (2022): "NFTs are also generally one of a kind, or at least one of a very limited run, and have unique identifying codes. Essentially, NFTs create digital scarcity, says Arry Yu, chair of the Washington Technology Industry Association Cascadia Blockchain Council and managing director of Yellow Umbrella Ventures".

NFTs artificially but efficiently introduce the concept of scarcity to the market of digital art. Historically, scarcity is the thing that makes financial value (and even royalty payments) possible.

This stands in stark contrast to most digital creations, which are almost always infinite in supply. Hypothetically, cutting off the supply should raise the value of a given asset, assuming it's in demand (Maddula, 2022). But many NFTs, at least in these early years, have been digital creations that already exist in some form elsewhere, like iconic video clips from NBA games or securitized versions of digital art that's already floating around on Instagram.

In this respect, NFTs allow individuals to create, buy, and sell things in an easily verifiable way using blockchain technology (Wele, 2022).

This is especially relevant when it comes to digital items, as NFTs give creators a way to establish an item's provenance. For the uninitiated, "provenance" is documentation that authenticates the creator, ownership history, and appraisal value of a particular piece of art. Prior to NFTs, there was no way to verify the creator and ownership history of digital works (Creighton, 2023).

The main advantage of the technology is the guarantee of authenticity, without this implying extra cost or the need for a regulatory authority. NFTs can be useful for resolving existing intellectual property rights. More than that, they can bring income to segments that today have difficulty controlling ownership (Leal, 2021).

NFTs are primarily part of the Ethereum blockchain. Like dogecoin or bitcoin, Ethereum is a cryptocurrency. However, Ethereum's blockchains support NFTs in addition to an ETH coin. Other blockchains are beginning to have their own NFTs. The code that makes NFTs work contains the artists' signature and the proof of sale built right into it.

Storey (2021a) sustained that there is no way to forge, fake or replicate the artwork so long as the NFT is part of the work. It confers uniqueness to the digital asset, and it is this fact in particular that has led to the recent boom in the collectability of digital art.

The caveat is that it is easy to screenshot an image or copy it and turn that fake into an NFT.

NFTs have become popular as collectable digital art objects, but they can represent many other things (Campaci, 2022):

- ownership of a music file
- a photo
- a document such as a diploma or title deed to a house
- a plane or concert ticket
- an item from a video game

- a meme
- access to exclusive experiences.

The list doesn't stop there and the limit for creating an NFT is only creativity. The applications of non-fungible tokens are potentially endless.

2 – NFTs and Art

The demand for NFTs has exploded recently and Art is the sector in which today NFTs express their best. This is a clear point on which is important to investigate in order to understand if the NFT features consist of stability or not. In this regard, specific aspects emerge from the analyses of Creighton (2023), Trevisi *et al.* (2022) and Storey (2021a).

For Creighton (2023) the NFT world is able to empower the role of artists, the general business of art, the collectability and the social benefits as well (Table 1).

Table 1 – NFT features in Art sector in accordance with Creighton (Source: Creighton, 2023)

Artists empowering	Publishers, producers, and auction houses often strong-arm creators into contracts that don't serve their interests. With NFTs, artists can mint and sell their work independently, allowing them to retain the IP and creative control. Artists can also earn royalties from *all* secondary sales of their work. In this respect, NFTs have the potential to create fairer models by bypassing the gatekeepers that currently control creative industries, and many individuals buy NFTs because it's a way of empowering and financially supporting the creators that they love.
Collectability	Despite costing less than 5 cents to make, a 1952 Mickey Mantle rookie card was sold for $5.2 million. This happened because of the history, rarity, and cultural relevance of the card. NFTs are, in many ways, the digital version of this. For individuals who want to build a collection of digital assets, NFTs offer a unique opportunity that hasn't existed outside of traditional collectibles and art markets ever before.
Investment	Some NFT owners simply want an asset that will increase in value. In this respect, some collectors treat NFTs as an investment — much like traditional art. Everyone can see and interact with the image. However, as noted, there can only be one NFT owner. For some, this is enough. Yet, market volatility makes NFT investment a high risk, with the potential for major losses.
Community	NFT ownership also comes with social benefits, as many creators have turned their NFT projects into vibrant communities. The Bored Ape Yacht Club is, perhaps, the best example of community building in relation to an NFT project. Collectors get access to a "members-only discord", exclusive merchandise, a vote in the future of the project, tickets to virtual meetups, and more. As such, for many collectors, owning an NFT how they socialize with friends and a matter of identity. To buy an NFT, it means to possess a digital certificate indicating the ownership that piece of art. NFTs make the verification of ownership much more manageable because it proves that such an individual owns that particular digital asset. As a result, digital art is easier to buy and sell.

Trevisi *et al.* (2022) sustained that currently the digital art market is exploding because of the involvement of individual artists and big brand names and organizations. The NBA, for example, sells its licensed digital collections as NFTs. In the analysis of Storey (2021a) successful NFTs tend to be novel ideas, birthed from creativity, and touched with uniqueness. Tokens that are sought after expressing cultural views and versatility, and they come from passionate, authentic artists with a strong presence. The term "success" is subjective, but successful art NFTs have usually some common characteristics (Table 2).

Table 2 – NFT features in Art sector identified by Storey (Source: Storey, 2021a)

Novelty	Because the NFT pool is so shallow compared to other markets, now is the time to put out wholly new work. This is the perfect time to create a new space and fill it up with works that represent the artist. The key is to look for inspiration all around you, but do not get so swept up in finding something to build onto or off of. While people first think of NFTs as digital artwork, the possibilities for non-fungible tokens exceed that. Now it's possible to find NFTs in the form of tweets, music, virtual worlds, poems, and so much more.
Creativity	Building on top of finding something new, successful NFTs are birthed from creativity. NFTs themself have broken through the box of what was perceived, and by pushing through those boundaries, artists can create something great.
Story	Integrating a story into the work helps with a few things. Humanity was built on stories, so it only makes sense to look for them in our everyday lives. NFTs with stories help fulfill this need. The story helps the audience connect to the piece. This boosts things like popularity and worth, but it also ensures that the piece is a topic for conversation. The story might be what is happening in the piece, but the artist can also explain the story that inspired or laid the foundation for the NFT. Tie multiple pieces together with a story, and the audience go crazy to piece them all together.
Rarity	Playing into the human "fear of missing out" can do a lot to boost the success of the NFT. Although anyone can own a copy of the NFT, there is something about being a unique owner of a piece. Create NFTs that are part of a set or limited edition. For example, an NFT that is only one out of 25 will be more sought. This is even more evident when you have one unique item.
Concept	NFTs that function inside certain concepts have a better chance of success than those that stand alone. For the most part, a concept can be defined as a general idea. With NFTs, this can be a specific theme that multiple pieces follow, something that constructs a piece that is bigger than just one token. Collections are a great example of how conceptualizing works. When the artist creates a collection, there is an inherent desire to own as many pieces as possible, even if the buyer do not necessarily like every piece in the collection. Artists can also add abstract details to the NFT, like easter eggs or hidden messages, which will fuel the piece's success.

Desirability	An NFT with no desire will not find success.
Culture	An NFT that fits into the current cultural climate will have more success than one that is off the wall. Culture helps link it to conversations and people; it keeps the piece relevant regardless of its format. Culture might be as broad as what is trendy at the time, but the artist can also work with specific cultural groups. Even if the audience is smaller than it was previously, success in one specific community can weigh more than the success with a general audience. A culture that is appropriated or inauthentic will do more harm than good.
Versatility	NFTs do not need to be an image or a piece of digital art any longer. A format or style that provides more than visual appeal, something that people can either benefit from or use will be more appreciated.
Presence	Establishing a presence is somehow the easiest and most challenging thing to do, but it is essential for success.
Consistency	A successful NFT should have a background of support that is cultivated by consistency.
Authenticity	There is little work than work that blatantly lacks authenticity. People can usually sniff out inauthenticity, and they will avoid inauthentic works in favor of those birthed from passion.

2.1 – *Crypto Art Market: the status quaestionis*

The main source for the analysis of the Crypto Art Market during the last years is provided by Statista. As by "Crypto Art Market" Research report, the Crypto Art Market Size is projected to reach multimillion USD by 2028, in comparison to 2021, at unexpected CAGR during the forecast Period 2022-2028 (Androit Market Research, 2023).

While total sales value of art and collectibles NFTs worldwide amounted to just 30 million U.S. dollars in 2020, the NFT craze started in the following year caused this number to skyrocket, with the value of art and collectibles NFT transactions eventually surpassing 11 billion U.S. dollars in 2021 (Statista, 2023f).

Considering that global online sales of the art and antiques market, excluding NFTs, amounted to approximately 13 billion U.S. dollars that year, this helps put in perspective the huge impact of the NFT boom on the sector. That said, the monthly NFT sales value in the art segment fluctuated significantly since April 2021, recording much lower figures in 2022 than the peak of 844 million U.S. dollars reported in September 2021 (Statista, 2023d). Meanwhile, according to a December 2021 global study, art dealers selling non-fungible tokens in 2021 only represented six percent of the survey sample, while 46 percent of respondents worldwide did not sell any NFT that year and had no plan to do so in the future.

The global sales value of art and collectibles non-fungible tokens (NFTs) experienced a huge increase in 2021 over the previous years, peaking at 11.16 billion U.S. dollars. Overall, NFT sales in the art segment amounted to 2.57 billion U.S. dollars in 2021, rising from around 20 million U.S. dollars in 2020. Meanwhile, NFT transactions in the collectibles segment generated nearly

8.6 billion U.S. dollars in 2021, growing sharply from roughly 10 million U.S. dollars in the previous year (Statista, 2023f).

Total online sales in the art and antiques market worldwide rose by seven percent in 2021 over the previous year, after skyrocketing in 2020. Overall, the value of online transactions in the global art and antiques market amounted to 13.3 billion U.S. dollars in 2021, increasing by roughly 900 million U.S. dollars from 2020 (Statista, 2023c).

From April 2021 to February 2023, the total value of sales involving non-fungible tokens (NFTs) in the art segment fluctuated significantly. As of April 15, 2021, NFT sales recorded on the Ethereum, Ronin, and Flow blockchains during the previous 30 days generated an aggregated value of around 78 million U.S. dollars. While sales peaked at nearly 881 million U.S. dollars as of September 15, 2021, they experienced an overall decreasing trend in the following months. As of February 15, 2023, the aggregated sales value over 30 days amounted to roughly 21.1 million U.S. dollars. (Statista, 2023b).

2.2 – *The fluctuations of NFT art market*

In March 2021, auction house Christie's sold an NFT digital collage by American artist Beeple for the staggering price of 69.3 million U.S. dollars, making it the most expensive NFT sold worldwide. After the auction, NFT interest exploded. However, the 30-day aggregated sales volume of NFTs in the art segment fluctuated heavily from April 2021 to February 2023 (Kastrenakes, 2021) confirming the high volatility and sensitivity of NFTs to smaller events in bull markets (Chowdhury *et al.*, 2022).

According to a December 2021 study, just six percent of surveyed art dealers worldwide claimed to have sold non-fungible tokens (NFTs) in 2021. While 19 percent of respondents did not sell NFTs but were planning to do so in the following years, nearly half of interviewed art dealers did not report NFT sales and were not interested in selling NFTs (Statista, 2023e).

The massive 25% decline in USD traded between Q1 and Q2 2022 suggested that the sector had entered a new phase, one more sheltered from the ever-spinning spotlight it was used to in 2021. Q2 2022 net income was US$ 460M, a decrease from Q1 2022 by US$ 2.3B, where the secondary market remained predominant with almost 80% of USD volume traded, a difference of the primary market in significant suffering (Iachello, 2023).

In the light of the important role played, this analysis is confirmed by the evidence provided by Qui Finanza that has realized a deep analysis of the 2022 market trend. As reported by Maisto (2022), if the second quarter showed a drop of around 25% compared to the first quarter, the situation in the third quarter does not appear to have improved, with a drop of more than 75% in the volume of dollars traded. The most notable decline was seen in total resale profit volume, which plummeted from $2 billion in the second quarter to just $ 326 million (Maisto, 2022).

Unlike what happened in the second quarter of 2022, the secondary market also suffered losses, going from $1.4 billion to about $780.

The average price of NFTs also suffered from this trend, which stabilized at around $150.

In the face of little comforting economic data, it is possible to note that the size of the Communities suffers an average drop of 17% in the number of active portfolios. While the sales volume has stabilized slightly above 10 million trades per quarter.

The million active wallets per quarter continues to produce over 120,000 transactions daily (Maisto, 2022).

The trend observed by Qui Finanza in the second quarter is also confirmed in the third quarter as regards the secondary market, which continues to decline. It went from 90% of the volume of dollars traded to 80% to reach a threshold of 75% in the third quarter (Maisto, 2022).

In terms of the number of sales, the secondary market accounted for 70% in the first quarter, then 48% in the second and finally 46% in the third quarter.

In a context where most of the assets outstanding in the secondary market have lost their value, NFT owners prefer to keep them in their wallets, while still building their collections through the primary market (Maisto, 2022).

According to *Qui Finanza* previsions (Maisto, 2022), new buyers prefer to buy hopefully successful new collections, rather than buying collections that have already undergone the first NFT Bull Run.

Importantly, there are still more buyers than sellers, with a ratio of approximately 1.3 buyers to 1 seller. This ratio was the same in the second quarter and stood at about 1.6 at the start of the year. The volume of buyers and sellers appears to stabilize at approximately 150,000 buyers per 110,000 sellers at the end of the third quarter (Maisto 2022).

In a context in which the Collectibles segment continues to experience a significant of weekly resale losses, the Utilities segment surprised with an exceptional performance and the Art sector declined: the number of collectors who have bought or sold a work of art has halved, while the volume of transactions has decreased by 38% (Maisto 2022).

3. The opportunities provided by NFTs

After analyzing the market trends, it is interesting to ask if there are valid reasons to believe that NFTs can play an increasingly important role in our digital society, not necessarily (or not only) linked to collecting, art and speculation. Some recent data provided by the Blockchain & Distributed Ledger Observatory of the Politecnico di Milano (2022), give interesting points of view.

Unlike many cryptocurrencies, NFTs perform a clear function: thanks to the blockchain, they allow the transfer of the concept of property - and therefore of value - even in a world that until recently lacked it such as the digital one, historically characterized by infinite reproducibility. NFTs are therefore a certificate that certifies the ownership of a digital asset: in a world where these assets are part of an increasingly important market (just think of the accessories for personalizing the protagonists of video games), a tool of this type offers advantages important (Politecnico di Milano, 2022).

"Many of the most promising uses concern disparate fields: from the financial sector to digital identity, from logistics to marketing", always points out the Observatory of the Polytechnic (Politecnico di Milano, 2022). The important thing is to stop associating NFTs only with CryptoPunks and Bored Ape Yacht Club and consider them for what they are: digital certificates of ownership. Which as such can also simply replace the traditional ones, automating some very important processes.

The Observatory of the Polytechnic always explains that "in the logistics sector, NFTs can create 'digital passports' which testify to the passages along the supply chain of a specific product, exploiting the immutability of the information recorded on the blockchain. The possibility of representing non-counterfeitable identity certificates through NFTs is also particularly interesting in the field of digital identity" (Politecnico di Milano, 2022).

Furthermore, other key aspects can have been identified by Storey (2022) in relation to the opportunities of NFTs.

In this regards he explains that various are the points that can exalt the added value to the Art Business and we report as indicated in Table 3.

Table 3 – Main added value provided by NFTs in Art identified by Storey (Source: Storey, 2022)

Certificates of authenticity	Proof of purchase	Fraud-proof receipts	Fractional Ownership
Many rare items and fine artworks have traditionally had physical certificates of authenticity associated with them. These physical certificates are relatively easy to forge and can make ascertaining the value of a physical artwork difficult. NFTs are much harder to alter and help verify an artwork's true worth.	A large part of how NFTs are used with physical assets is how they are used to prove right of ownership. This is especially important for non-tangible media items like music files or with physical artworks that may not remain in the buyer's possession, such as artworks on loan at museums.	Counterfeit receipts allow criminals to claim the value of a media piece or artwork without having to pay for it. NFTs are fraud-proof receipts of purchase that are near-impossible to forge.	NFTs allow for the accounting of multiple owners owning one asset otherwise known as fractional ownership. This allows a valuable asset to be owned by numerous individuals.

3.1 – *NFT usage and ownership rights*

NFTs have a nuanced relationship with the assets tied to them. While an NFT is designed to represent the original asset on the blockchain, the NFT itself is seen as a separate entity from any content it contains. NFTs can be compared to trading cards

Owing a vintage baseball card or a popular trading card from a collectible card game, like Magic: The Gathering, means owing a representation of the original work — but not the owing of the original work itself. The copyright for the artwork, design, and branding of the card you possess are wholly owned by the card's manufacturer (Creighton, 2023).

In the same way, while NFTs represent an item on the blockchain, ownership of an NFT does not transfer the intellectual property or usage rights of that original work to NFT's owner.

Following the example provided by Creighton (2023) buying an NFT that contains the very first digital copy of *Harry Potter and Sorcerer's Stone*, means the ownership of the NFT. But that doesn't mean the possess of the right to sell Harry Potter merchandise, make Harry Potter movies, or give others permission to use the Harry Potter IP for commercial purposes.

Sadly, NFT ownership and usage rights are often conflated, which has given rise to some buyers purchasing NFTs with the mistaken understanding that an NFT effectively gives them the rights to expand upon (and capitalized from) well-established IPs (Creighton, 2023).

Of course, there are some exceptions to these hard and fast rules. Bored Ape Yacht Club has stated publicly that all BAYC NFT owners have full commercial rights to that Ape. It can be monetized however the NFT owner sees fit to do so. Some projects like CrypToadz and Nouns have taken this even further by releasing their IP to the public domain under Creative Commons (known as CC0). But they should be viewed as the exception, not the rule (Creative Commons, 2023).

Using self-minting platforms like Open Sea, it's possible for any user to mint a new NFT using copyrighted content that they don't own. This is dangerous for the minter, buyers, and the original artist for a few reasons (Creighton, 2023):

- by profiting off of illegitimate content, sellers and buyers open themselves up to legal action by the legitimate copyright holders;
- legitimate NFTs issued by the copyright holder may be devalued by illegitimate NFTs of the same work;
- buyers may not know that the content they've purchased is illegitimate or that they've put themselves in legal jeopardy with an illegitimate trade.

Concerns around legitimacy are one of the reasons that verified NFT projects and accounts are preferable. To stay safe on NFT marketplaces, always look for verified projects on platforms (Open Sea, 2023), and only follow links from official (and verified) [X, 2023] user accounts on social media.

In the case of sales that take place via official websites, like with Art Blocks or NBA Top Shot, buyers can act with confidence knowing that their NFT comes from a legitimate source.

3.2 – *NFT and copies in art*

One of the biggest controversies in the world of NFTs is how easy it is to copy NFT artwork. Though Beeple sold an NFT for $69 million (Kastrenakes, 2021), anyone with a computer and internet can access it and copy it making a screenshot if even the resolution will be poor.

However, this doesn't mean the ownership of the image. Only the person who purchased the artwork at auction is the owner (Storey, 2021c).

This is where many people can get confused. NFTs are like a piece of physical art: it is possible to purchase life-like replicas of the Mona Lisa. Yet, unlike hand-painted artwork, though, there are no subtle differences to tell the two apart. The NFT artwork will be identical, down to the pixel level.

Copying an NFT is a complex business. In many cases, copying the artwork is easy; it just needs to take a screenshot, and it possible to have an exact copy. But replicating the token itself is almost impossible, as it is stored on the blockchain. Even owning the NFT, often it doesn't mean owing any rights to the image. They will lie with the artist (Storey, 2021c).

NFTs are embedded on the blockchain, a complex chain of transactions; it stretches back to when the artist placed the NFT on the market after minting it and shows all the times it has changed hands from owner to owner. This digital ledger is then split between every machine in the network.

The blockchain can be thought as a digital title deed. This ledger is constantly being updated and checked by every computer on the network. As a result, it is difficult to steal the ownership rights of an NFT.

NFTs can be stored on online wallets, in fact, a digital wallet can be used to purchase, sell and mint NFTs.

Even when an identical NFT is released onto the market, it will have a slightly different address. Though the artworks are identical, the two won't be interchangeable (Storey, 2021c).

Multiple NFTs can be officially released of the same image as a series, depending on the artist's intention. However, each of these will have a unique place on the blockchain. This is what makes them original and impossible to replicate fully.

In this case, it's best to think of these as signed copies of a book. Though each novel is the same, and all have been signed by the same author, they are all slightly different. They are all unique copies. Sometimes NFT artists will release a limited series of artwork, like 25 of the same exact image, or other times there is a timed-release where an artist will release the same image for say 60 minutes and the number of images released onto the market depends on how many buyers made the purchase in 60 minutes (Storey, 2021c).

3.3 – *NFTs: a transparent way of proving ownership*

For quite some time now, many people have been hesitant to trade items of extreme value because it is often difficult to prove ownership or authenticity. NFTs are changing the way such investors view these items. In a nutshell, a non-fungible token is stored directly on the blockchain. This means that any digital or physical asset has a proven record of ownership.

It is this transparency that proves NFTs ca provide a specific contribution. It was not long ago that it is was somewhat difficult to prove ownership of significant assets. For example, it was virtually impossible to determine the exact day and time that the asset was purchased. This is no longer a concern with NFTs.

The blockchain technology that forms the backbone of NFTs enables businesses to execute transactions that all parties can trust. The entire process is transparent every step of the way, and it is easy to live up to the terms of any contract that is executed.

NFTs are changing the world because they will play a major part in the buying of cars, houses, or attending major events (Trevisi *et al.*, 2022). A non-fungible token will make all these things and more possible in a more authentic and trustworthy manner. This benefits businesses, artists, and consumers alike. This doesn't mean that NFTs don't have their own issues, but it is possible to say this world has decreased these challenges to almost null.

4 – NFTs criticalities in art business

Although the extension of blockchain and other digital technology to the world of art and music represents a new and exciting platform for creative expression (Trautman, 2021), NFTs are still a new phenomenon. As a result, the market is vulnerable to scams that can take advantage of unsuspecting collectors. The current available literature provides very useful investigative starting point in this regard (Figure 1).

4.1 – *Copyright law and art*

The technological and legal problems for NFT spread in business is surely one of the most discussed topic (Kashevarova & Starikova, 2022).

Copyright is separate from the work of art itself as a physical or digital object. It's abstracted away from it. The copyright is born and attached to the work of art at the moment of its creation. This goes for oil paintings, sound recordings, digital art, or any other creative medium.

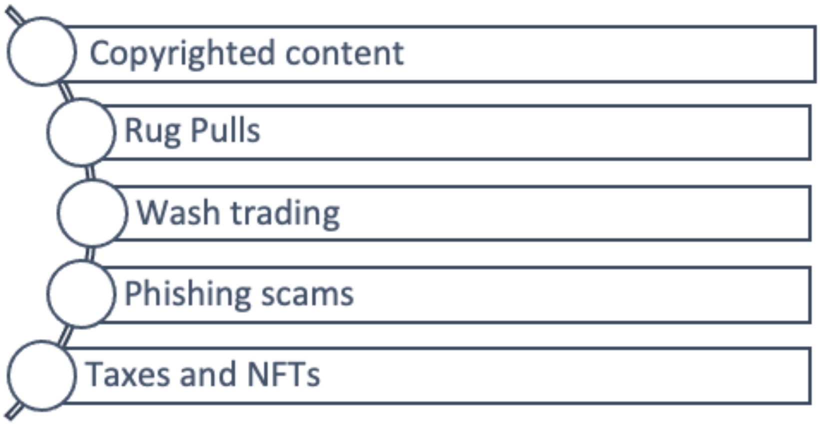

Fig. 1 – Main critical aspects related to NFT in Art in accordance with the literature review
(Source: authors' elaboration

For Storey (2021b) there are multiple "rights" involved when we talk about copyright. They include the following:

- right to control the manufacture of copies of the original piece.
- right to control the sale, licensing, or transferring of the copyright itself.
- right to control who can produce 'derivatives' (new works based on the original).

Purchasing a physical piece of art, like an original painting, means only purchasing the object, not the copyright of the work itself. Those remain with the artist or whoever owns them (like an estate).

Owning the physical object means that the owner can display it, sell it, loan it, but not make copies of it. The owner couldn't, for example, sell prints of it. The right to do that remains with the copyright owner.

It is possible trying to buy those rights from the original owner, but that would be a separate transaction (Storey, 2021b). Digital art is no different than physical, non-digital art. The same copyright and ownership rules apply, in theory. But they are made murky and muddled by the fact that NFT's are not regulated at the moment by a governing body.

This means that enforcing copyright infringement of digital assets is an ongoing headache for artists and has been long before NFTs came around (look at the issue of digital piracy in the film, music, and ebook industry).

Most of the time, it's possible to buy a digital art NFT through a marketplace that serves the same function as an auction house, or eBay, for that matter. Auction houses and eBay connect sellers with potential buys with physical assets, such as an individual oil painting or statue (Storey, 2021b).

NFT marketplaces do the same thing but with digital assets.

In both cases, buyer and seller agree upon terms of sale. Buying a physical artwork from the artists in a first-time sale, the artist herself creates the terms and conditions. In most cases, this will *not* include the sale of copyright.

Buying an NFT of original digital art from the artist means the same that as buying a physical artwork from its owner. Unless the terms of sale specifically say so, the buyer is not purchasing the copyright but ownership of a digital asset.

If the seller does not explicitly state that the buyer is assigned the copyright, he presumably owns the NFT artwork in the same way that a physical painting's purchaser does.

In other words, he would have the right to own the NFT itself (the digital asset), as well as the right to sell or otherwise transfer it to someone else. But he would not have the right to make copies or derivatives or transfer the digital asset's copyright (Storey, 2021b).

The ownership of the image will rest with whoever has the copyright. In this case, the world of NFTs will operate in a similar way to the real world.

In most cases, the copyright will remain with the original artist.

An example is related to the NBA Topshots that are NFTs made of famous sporting moments.

Storey (2021b) underlines that purchasing one of these NFTs does not mean also the ownership of the copyright for that clip, that remains with the NBA.

As a result, NFT's owner won't be able to commercialize it, like turning it into T-shirts. Doing that, the NBA will have the legal right to sue, a case they would easily win. Though the rules for other NFTs aren't as explicitly laid out, the same principles apply. The original artist, not the owner of the NFT, has the copyright.

The only exception to this rule is when the agreement between the creator of the NFT and the buyer stipulates that the buyer will receive the full copyright. However, in most cases, this won't be the case.

The original artist of the image is also recorded through the blockchain. When someone uploads an NFT, it is known as minting. This is permanently included in the ledger and can't be changed (Storey, 2021b).

4.2 – *Rug pulls*

Even though large generative projects are preferred by collectors, there's not always safety in numbers, and no NFT project is entirely without risk. In fact, many projects have fallen apart due to rug pull scams (Creighton, 2023). A rug pull (Huang *et al.*, 2023; Sharma *et al.*, 2023) occurs when the project creators take the investment money for the project and disappear. By absconding with all of the money, the team leaves collectors with a valueless asset. Sharma *et al.* (2023) esteemed one NFT collection attempting 37 rug pulls within three months.

It must be stressed that not every kind of rug pulls is illegal. Surely, they are not ethical. But if a project promises to donate funds and then chooses to keep the money, there isn't much that anyone can do. In rare instances, a rug pull may count as fraud, but this often isn't the case (Creighton, 2023).

Rug pulls can also happen when NFT developers remove the ability for investors to sell their tokens. These kinds of rug pulls are illegal, and it could be possible to recoup the money, at the cost of a lengthy court battle. Additionally, many NFT creators don't use their legal names, so it may be difficult (or even impossible) to track them down.

4.3 – *Wash trading*

As with stocks and other collectibles, market manipulation can happen during NFT auctions. Working together, a group of potential buyers can drive up the price of an NFT by artificially inflating the bid price until an unsuspecting buyer joins the fray (Creighton, 2023). After the sale, the asset deflates in value, leaving the buyer with a valueless NFT. One of the most common ways of doing this with NFTs is with wash trading (von Wachter *et al.*, 2022; Bonifazi *et al.*, 2022; La Morgia *et al.*, 2022). Wash trading occurs when a user controls both sides of an NFT trade, selling the NFT from one wallet and purchasing it from another.

When many transactions like this are executed, the trade volume rises. As a result, it looks like the underlying asset is highly sought after. This has the effect of increasing the value (the price) of the NFT in question. In fact, some NFT wash traders have executed hundreds of transactions through self-controlled wallets to try and increase demand (Creighton, 2023).

4.4 – *Phishing scams*

Whether through fake advertisements, NFT giveaways, or some other form of coercion, scammers will sometimes ask for private wallet keys and/or other sensitive information like the seed phrase (Creighton, 2023; Kshetri, 2023).

Depending on what information they get access to, the scammer can then access wallets and remove any cryptocurrency or NFTs stored within or sign transactions without owner's consent. Because blockchain is decentralized and often anonymous (i.e. there's no regulatory authority and individuals don't have submit proof of identity to use it) there's generally no way to recover the assets if this happens (Craighton, 2023).

Just like password phishing emails, these scams come in all stripes, and they can be very hard to spot.

4.5 – *Taxes and NFTs*

Taxes, as they pertain to NFTs and crypto, can be complicated (Cheong, 2022). Especially since tax responsibilities vary by country. But throughout every context, a crucial facet of NFTs and taxes is that acquiring a large sum of money by trading NFTs will almost always be considered a capital gain, and be taxed as such (Creighton, 2023).

On the other hand, NFT creators — those who have minted and sold their own NFTs — will need to separate trading income from that of the sales of their own pieces. The NFT artist/creator is have to pay taxes on the profits. Profits for NFT creators are not considered gains, rather, they're income. And this income will be taxed at your regular (usually self-employed) income tax rate. Again, tax specifics will vary based on the legalities within every country and NFTs are not a tax-free investment (Creighton, 2023).

5 – Results

The investigation about NFTs has been carried out through two analytical aspects: the statistics provided by Statista data and the literature perspective. In accordance with the statistical data, the global sales value of art and collectibles non-fungible tokens (NFTs) rose in 2022 over the previous year, following a sharp increase in 2021. However, while sales of NFT collectibles grew, the value of art-related NFT transactions declined over the same period. While total sales value of art and collectibles NFTs worldwide amounted to circa 30 million U.S. dollars in 2020, the NFT craze started in the following year caused this number to skyrocket. In this respect, the monthly NFT sales value in the art segment fluctuated significantly since April 2021, recording much lower figures in 2022 and 2023 than the peak of nearly 900 million U.S. dollars reported in September 2021.

The analysis of the literature highlights several aspects that in our opinion are correlated and should be further deepen investigated to explain the market fluctuation. More specifically, while NFTs can express an innovative way to realize art (Habrel, 2022; Qin *et al*., 2021) improving the art business (Leal, 2021) and provide ownership certification (Politecnico di Milano, 2023; Storey, 2022), the literature review (Creighton, 2023; Huang *et al*., 2023; Kshetri, 2023; Sharma *et al.* 2023; Cheong, 2022, Bonifazi *et al*., 2022; Kashevarova & Starikova, 2022; La Morgia *et al*., 2022; Storey, 2022; von Wachter *et al*., 2022; Kong and Lin, 2021; Storey, 2021b) also demonstrates that there are still many important weak points that need to be remedied due to criminal actions and the absent or incomplete regulatory principles like the copyright law and the complicated taxes aspect which varies from country to country.

6 – Conclusions

To date, given the decreasing trends in digital art purchase volumes and the volumes no longer reached in 2021, many people, including professionals and art and collecting enthusiasts, are wondering about the state of health of the crypto art market and its future.

Even considering the slowdown in transactions, the reduction in prices, the production difficulties of the platforms which have had to lay off several employees already in 2022 and a general cooling of public enthusiasm, the figures on NFT volumes are not dramatic.

To date, several questions remain in various areas, from safety to ease of display, and certainly the market is recalibrating itself in a very substantial way. However, the world of museums and institutions of the traditional art system are instead looking with curiosity at the creative pockets who work with NFTs and blockchain.

Furthermore, the market seems to have shifted to the search no longer for quantity, but rather for quality. NFTs are a new product, based on a new "technology" which is therefore, to date, not fully regulated. We are moving in a gray area, with many aspects still to be defined, laws still to be passed, regulations to be created. This has made the investor insecure and, consequently, more fearful in purchasing digital assets.

Greater regulation and consequent consumer protection would boost the growth of the crypto-art market.

7 – References

Bonifazi, G., Cauteruccio, F., Corradini, E., Marchetti, M., Montella, D., Scarponi, S., Ursino, D., & Virgili, L. (2023). Performing Wash Trading on NFTs: Is the Game Worth the Candle? *Big Data Cogn. Comput*, 7(1), 1-38. https://doi.org/10.3390/bdcc7010038

Cheong, B.C. (2022). Application of Blockchain-enabled Technology: Regulating Non-fungible Tokens (NFTs) in Singapore. *Singapore Law Gazette*. Available at SSRN: https://ssrn.com/abstract=4009972

Chowdhury, M.A.F., Abdullah, M., Alam, M., Abedin, M.Z., & Shi, B. (2022). NFTs, DeFi, and Other Assets Efficiency and Volatility Dynamics: An Asymmetric Multifractality Analysis. Available at SSRN: https://ssrn.com/abstract=4248315

Dragos Popescu, A. (2021). Non-Fungible Tokens (NFT) – Innovation beyond the craze. 5th International Conference on Innovation in Business, Economics & Marketing research (IBEM2021), Proceedings of Engineering & Technology, *66*, 26-30.

Habrel, T. (2022). Crypto art: a new era in art vs adventure challenge. *Culture and arts in the modern world*, (23), 85-92.

Huang, J., He, N., Ma, K., Xiao, J., & Wang, H. (2023). A Deep Dive into NFT Rug Pulls. *Computer Science, Cryptography and Security*, *1*(1), 1-16. Available online at: https://arxiv.org/pdf/2305.06108.pdf

Kashevarova, N., & Starikova, I.S. (2022). Non-fungible token: a promising digital tool for business. *Vestnik Universiteta*, (3), 44-51.

Kshetri, N. (2023). Scams, Frauds, and Crimes in the Nonfungible Token Market. *Computer*, *55*(4), 60-64.

Kong, D., & Lin, T. (2021). Alternative Investments in the Fintech Era: The Risk and Return of Nonfungible Token (NFT).
Available online at SSRN: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3914085

La Morgia, M., Mei, A., Mongardini, A. M., & Nemmi, E. N. (2022). A Game of NFTs: Characterizing NFT Wash Trading in the Ethereum Blockchain. *Computer Science, Computers and Society*, *1*(1), 1-12. Available online at: https://arxiv.org/pdf/2212.01225.pdf

Ndubuisi, G., & Guesmi, K. (2022). Quantile return and volatility connectedness among NonFungible Tokens (NFTs) and (un)conventional asset. *UNU-MERIT* , Working Papers No. 017.
Available online at: https://www.merit.unu.edu/publications/wppdf/2022/wp2022-017.pdf

Politecnico di Milano (2022). La crisi nera dei collectibles digitali: è la fine degli NFT? Available online at: https://blog.osservatori.net/it_it/nft-collectibles-digitali

Qin, W., Rujia, L., Qi, W., & Shiping, C. (2021). Non-Fungible Token (NFT): Overview, Evaluation, Opportunities and Challenges. *Computer Science*, *1*(1), 1-22. Available online at: ArXiv abs/2105.07447 (2021)

Rangone, A., & Busolli, L. (2021). Managing charity 4.0 with Blockchain: a case study at the time of Covid-19. *International Review on Public and Nonprofit Marketing*.
Available online at: https://doi.org/10.1007/s12208- 021-00281-8

Sharma, T., Agarwal, R., & Shukla, S. K. (2023). Understanding rug pulls: an in-depth behavioral analysis of fraudulent nft creators. *Computer Science, Cryptography and Security*, *1*(1), 1-25. Available online at: https://arxiv.org/abs/2304.07598

Trautman, L. J. (2021). Virtual Art and Non-fungible Tokens. *Hofstra Law Review* (50), 361-426.

Urom, C., Ndubuisi, G., & Guesmi, K. (2022). Quantile return and volatility connectedness among Non-Fungible Tokens (NFTs) and (un)conventional asset. UNU-MERIT. Working Papers No. 017. Available online at: https://www.merit.unu.edu/publications/wppdf/2022/wp2022-017.pdf

Valera, S. C., Valdés, P. F., & Viñas, S. M. (2021). NFT and digital art: new possibilities for the consumption, dissemination and preservation of contemporary works of art. *Artnodes* (28), 1-10.

Von Wachter, V., Rude Jensen, J., Regner, F., & Ross, O. (2022). NFT Wash Trading Quantifying suspicious behaviour in NFT markets. *Computer Science, Cryptography and Security* 22(02):1-14. Available online at: https://arxiv.org/pdf/2202.03866.pdf

Xia, T., & Minshall, T. (2013). Understanding patterns and investments in new firms in emerging science and technology-based industries in the UK. In: Oakey, R., Groen A., Cook G. and Van Der Sijde, P. (Ed.). *New Technology-Based Firms in the New Millennium*, *10*, 7–32.

Zhuang, C., Chen, G., & Wang, L. (2019). Internet resources and organizational knowledge creation: Role of environmental dynamism. *The Journal of Operations Research Society of China*, 7, 337-354.

8 – Sitography

Androit Market Research. (2023). *Crypto Art Market by Type, Application, and Region.* Global Forecast 2021 to 2031. Available online at: https://www.adroitmarketresearch.com/industry-reports/crypto-art-market]

Campaci, E. (2023). Cosa succede nello spazio NFT? I dati e le ultime novità. Young platform. Available online at: https://youngplatform.com/blog/news/mercato-nft-news-dati-dicembre-2022-monitorare/

Campaci, E. (2022). Are all NFTs the same? Here are the main types. *Young Platform*. Available online at: https://youngplatform.com/en/blog/news/types-nfts-pfp-blue-chip-dynamic/

Clark, M. (2022). NFTs, explained / I have questions about this emerging...um...art form? Platform? *The Verge*. Available online at: https://www.theverge.com/22310188/nft-explainer-what-is-blockchain-crypto-art-faq

Conti, R. (2023). What Is An NFT? How Do NFTs Work? *Forbes*. Available online at: https://www.forbes.com/advisor/in/investing/cryptocurrency/what-is-an-nft-how-do-nfts-work/

Creative Commons (2023). CCO. "No Rights Reserved". Available online at: https://creativecommons.org/public-domain/cc0/

Creighton, J. (2023). NFTs Explained: A Must-Read Guide to Everything Non-Fungible. *NFT now*. Available online at: https://nftnow.com/guides/what-is-nft-meaning/

DappRadar. (2021). TRON introduces NFT standard TRC-721. Available online at: https://dappradar.com/blog/tron-introduces-nft-standard-trc-721

Eckler, M. (2021). An introduction to NFTs. *Practical Ecommerce*. Available online at: https://www.practicalecommerce.com/an-introduction-to-nfts

Iachello, F. (2023). Il mercato NFT torna ad accelerare! Le novità delle ultime settimane. *Young platform*. Available online at: https://youngplatform.com/blog/news/mercato-nft-novita-dati-gennaio/

Kane, I. (2021). TRON introduces NFT standard TRC-721. *DappRadar*. Available online at: https://dappradar.com/blog/tron-introduces-nft-standard-trc-721]

Kastrenakes, J. (2021). Beeple sold an NFT for $69 million. The Verge, available online at: https://www.theverge.com/2021/3/11/22325054/beeple-christies-nft-sale-cost-everydays-69-million

Leal, M. (2021). NFTs and their use beyond crypto art. *Medium*. Available online at: https://medium.com/nerd-for-tech/nfts-and-their-use-beyond-crypto-art-ae2a4931e5a3

Maisto, D. (2022). NFT, cosa potrebbe succedere nel 2023. *Qui Finanza*. Available online at: https://quifinanza.it/innovazione/nft-cosa-potrebbe-succedere-nel-2023/681381/

Open Sea. (2023). What is a verified account or badged collection? *Open Sea*. Available online at: https://support.opensea.io/hc/en-us/articles/360063519133-What-is-a-verified-account-or-collection-

Ravikiran, S. (2023). Discover NFTs: Your Ultimate Guide to Non-Fungible Tokens. Available online at: https://www.simplilearn.com/tutorials/blockchain-tutorial/what-is-nft

Rossow, A. (2022) Scams Explained: What Are Rug Pulls? Are They a Crime? Available online at: https://nftnow.com/guides/scams-explained-what-are-rug-pulls-and-are-they-a-crime/

Sharma, R. (2023). Non-Fungible Token (NFT): What It Means and How It Works. Available online at: https://www.investopedia.com/non-fungible-tokens-nft-5115211

Statista (2023a). Sales value art and collectibles nfts worldwide. Available online at: https://www.statista.com/statistics/1299636/sales-value-art-and-collectibles-nfts-worldwide/

Statista (2023b). Crypto art - statistics & facts.
Available online at: https://www.statista.com/topics/7626/crypto-art/

Statista (2023c). Total online sales of the art and antiques market worldwide from 2013 to 2022. Available online at: https://www.statista.com/statistics/886776/online-art-and-antiques-market-total-global-sales/

Statista (2023d). Total value of sales involving a non-fungible token (NFT) in the art segment worldwide over the previous 30 days from April 15, 2021 to September 15, 2023. Available online at: https://www.statista.com/statistics/1235263/nft-art-monthly-sales-value/

Statista((2023e). Share of art dealers selling non-fungible tokens (NFTs) worldwide in 2021. Available online at: https://www.statista.com/statistics/1299649/art-dealers-selling-nfts-worldwide/

Statista (2023f). Total sales value of art and collectibles non-fungible tokens (NFTs) worldwide from 2019 to 2022. Available online at: https://www.statista.com/statistics/1299636/sales-value-art-and-collectibles-nfts-worldwide/

Storey, A. (2022). Can an NFT Be a Physical Object? Poster Grid.
Available online at: https://postergrind.com/can-an-nft-be-a-physical-object/

Storey, A. (2021a). 11 Things That Make a Successful NFT (4 Is An Eye-opener). *Poster Grind*. Available online at: https://postergrind.com/11-things-that-make-a-successful-nft-4-is-an-eye-opener/

Storey, A. (2021b). Is NFT Art Protected by Copyright Law? (How To Get Sued). *Poster Grind*. Available online at: https://postergrind.com/is-nft-art-protected-by-copyright-law/

Storey, A. (2021c). Can NFTs Be Copied? 7 Things to Know. *Poster Grind*. Available online at: https://postergrind.com/can-nfts-be-copied-7-things-to-know/]

Thomas, S., & Schwartz, E. (2014). Smart oracles: A simple, Powerful Approach to Smart Contracts. Available online at: https://perma.cc/S5TV-Q3JH

Trevisi, C., Visconti, R.M., & Cesaretti, A. (2022). Non-Fungible Tokens (NFT): business models, legal aspects, and market valuation. *Media Laws*.
Available online at: https://www.medialaws.eu/rivista/non-fungible-tokens-nft-business-models-legal-aspects-and-market-valuation/

Vella, G. (2022). La crisi nera dei collectibles digitali: è la fine degli NFT?. *Osservatori*. Available online at: https://blog.osservatori.net/it_it/nft-collectibles-digitali/

Wele, P. (2022). How businesses can benefit from evolution nfts. *International Finance*. Available online at: https://internationalfinance.com/how-businesses-can-benefit-from-evolution-nfts/

X. (2023). How to get the blue checkmark on X.
Available online at: https://help.twitter.com/en/managing-your-account/about-twitter-verified-accounts