# NFTs: The Digital Assets Capable of Restructuring Media Industries

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April 21, 2021

## I. Introduction

On March 23, 2021, a tweet reading “just setting up my twttr” composed in 2006 by Twitter’s CEO Jack Dorsey sold for 2.9 million dollars (Harper). The purchase was made by a Malaysian businessman using the cryptocurrency Ether and recorded using blockchain technology (Harper). Although the tweet still exists as a public file, readily downloadable and copyable on the internet, this businessman acquired the unique rights to sell, destroy or exchange this iconic tweet upon his purchase. In other words, the tweet was sold as a non-fungible token. A non-fungible token is a unique digital asset whose metadata is stored permanently and immutably using blockchain technology. These differ from cryptocurrencies like Bitcoin in that while any one Bitcoin could be exchanged for another, each crypto asset is unique and its value cannot easily be exchanged for another of its kind (Chevet 5). Enter the notions of ownership and scarcity into the crypto universe. The ability to buy, sell and trade valuable digital assets has presented major opportunities for media-related industries, and further, the potential to restructure the supply chain of such businesses. This paper will discuss NFT’s impact on gaming, music and sports-related businesses, and will discuss the limits and implications of such revolutionary technology.

## II. The Origins of Non-Fungible Tokens

Although the topic of some debate, general consensus in the tech world holds that the original cryptocurrency, Bitcoin, emerged onto the scene in 2009 (Chevet 9). Created by Satoshi Nakamoto (later determined to likely be a pseudonym for a group of developers), the digital currency was the first to utilize blockchain technology to decentralize online transactions

(Chevet 7). To clarify, the utility of this burgeoning currency would be to bypass the control of centralized entities like banks and government systems (brokers who take a percentage when handling funds), to allow truly free online exchange between peers (7). This decentralization also renders the inflation or demonetization of the currency theoretically impossible (11). However, in the development of earlier cryptocurrencies, cutting out the systems which traditionally acted to update and enforce a ledger created a "double spending problem" with digital currencies that could easily be copied, pasted, and spent again (7). Bitcoin cleverly constructed a solution using blockchain technology. Blockchain technology supports cryptocurrencies in this way: after a transaction is processed, verified, and validated by nodes, large networks of peer-to-peer computers, the transaction is amalgamated into a larger transaction history and stored in a block of data poised to enter the blockchain (8). The blockchain, simply, serves as a permanent, unalterable, digitized ledger for all transactions ever made in a certain cryptocurrency. A cryptocurrency, therefore, is a "medium of exchange, created and stored electronically in the blockchain using encryption techniques to control the creation of monetary units and to verify the transfer of funds" (8). Cryptocurrencies can also be defined by three distinct features. One: the currency has no intrinsic value (8). Because the currency is not backed by any real-world commodity (gold) its economics are solely governed by the principles of supply and demand. Two: cryptocurrencies exist in no tangible form; and, three: neither the supply nor the audit of the currency is not dependent upon a centralized entity (8).

As in the development of any market economy, the principles of exchange or trade are accompanied by the concept of ownership. In the digital realm, ownership of what would be referred to as crypto assets were made possible by the advent of the non-fungible token or NFT.

Simply, NFTs are “unique tokens representing digital file[s]” (Walden). Linked to the NFTs unique ID is a vast amount of metadata detailing the provenance of the NFT and the asset to which it is linked (Walden). The ability of the NFT to archive this data significantly increases the value of the asset as the cultural and financial data linked to the piece can be traced and evaluated (Walden). Additionally, this tokenization creates a new marketplace in which digital assets can be bought, sold, and traded. Briefly, from an economic perspective, because digital assets were in infinite supply prior to their tokenization, their monetary value was incredibly low, but upon the advent of the NFT which restricted the supply of such assets, these entities suddenly gained (what is today immense) commercial value. To provide context, the first crypto-asset came in the form of Rare Pepes. In 2014, images of the internet meme Pepe began circulating with each user who encountered the image adding an increasingly obscure pop-culture reference to increase the meme’s rarity (Chevet 32). Because publication to the internet meant the nullification of the rarity of the meme, participants created a blockchain “to provide the users with actual scarcity, allowing them to buy, sell, and trade Rare Pepes” (Chevet 32). To clarify, each Rare Pepe meme was tokenized and distributed to consumers for a price via the online NFT “gallery,” Counterparty (33). The digital ledger recording such transactions was maintained via the main Bitcoin blockchain (33).

**III. Benefits of Switching to an NFT Model**

Before the advent of crypto-assets like Rare Pepes, the management of digital and digitized artworks was done through proofs of ownership and Digital Rights Management (34). Digital Rights Management is a system that regulates user’s access to digital assets and therefore

was an essential system for creative entities as it restricted a user's ability to copy content (34). For example, these systems require video game users to register proof of ownership online, and when installed in e-books, limit the number of devices on which the book can be accessed (34). The downside to these systems is that they are controlled by the original publisher of the content (or whoever thereafter may possess the necessary copyrights) which is raising user concerns about privacy and how the owner may alter the content on a user-by-user basis (34). After all, the user doesn't own the content they may have created or altered through the platform. Creators harbor additional concerns about these systems. Because of the resources and capital necessary to regulate one of these systems they impose a serious barrier for those looking to enter any market (35). A similar problem exists regarding content ownership on the internet. On social media, when creators post a file they also transfer ownership of that file to the platform itself as specified in each social platform's Terms of Service, meaning the platform is now in control of the monetization of every user's creation (Walden). While these platforms provide economies of scale and distribution networks to creators, their monetization models are typically not written with the best interest of the creator in mind (Walden).

The advent of NFTs could provide a nearly unflawed alternative to these systems. NFTs will displace these norms by altering one essential piece of the model: creators can now own the platforms themselves. Jesse Walden, former artist manager, co-founder of Mediachain Labs, and current investor in crypto start-ups, dubs this futuristic entity the Ownership Economy: "a broader thesis that the next generation of internet platforms will be built, operated, and owned by users directly" (Walden). Walden maintains that because NFTs are programmable and open-source that any developer can build on them without being granted permission by or having to

dole out large sums to any third party. Additionally, because NFTs essential metadata is stored in an immutable and permanent blockchain this eliminates the need for any platform, company, or other third-party entity to stand in between creators and their online audiences. Essentially, NTF's will encourage the disintermediation of several media-related supply chains and greatly increase those market's liquidity. Walden also points out that the probability of adoption increases when you realize the new NFT-based model of direct-to-consumer distribution would benefit all stakeholders involved: creators, consumers, and developers. For creators, NFTs offer encoded royalty logic in the form of the token's provenance stored in the blockchain (Walden). Developers will be able to monetize building the digital infrastructures that support these systems and will take a percentage of all peer-to-peer transactions that occur using their systems (Walden). Lastly, prior to the advent of NFT technology consumers were restricted to renting access to online goods, but this new ownership model would allow patrons to earn value alongside the creators. In other words, ownership of a creator's NFT is the digital-analog to buying stock in a company that fluctuates in value in accordance with the success or failure (or in this case relative popularity) of the entity.

**IV. Gaming**

Online gaming was among the first markets to experiment with an NFT-based economic model. Since the first wave of so-called decentralized applications (dapps) in 2017, non-fungible tokens have earned gamers more than $20 million through trading, and startups roughly $13.6 million for selling the digital assets, according to blockchain analytics firm Flipside Crypto (Cuen). Additionally, these games allow users to accumulate significant monetary prizes at a

much faster rate than today's traditional gaming systems like Minecraft or Animal Crossing (Cuen). This is an attractive feature for most gamers, and in general, the more a company allows users to monetize the more successful the business. Marguerite deCourcelle reports that her startup Blockade Games sold $160,000 worth of crypto assets to blockchain game players as of July 5, 2020 (Cuen). Most of these assets included tokenized paintings with clues leading the buyer to an eventual bitcoin prize while newer assets sold by Blockade include digital art paired with spoken folklore overlaid (Cuen). Most NFT-based games of today function in this way: the token purchased by the user is the equivalent of an in-app purchase that can now be brought, sold, or traded amongst fellow players using NFT technology. For example, Decentraland "is a virtual reality universe similar to The Sims or Second Life" (Cryptopedia Staff). Users in this world can buy, sell and trade LAND and MANA tokens to accumulate other in-universe goods (Cryptopedia Staff). Additionally, these tokens can be used to gain entry to virtual experiences like art shows, games, and other specialized events (Cryptopedia Staff). Because NFTs are a currency whose valuation is entirely dependent upon the principles of supply and demand, the relative value of these tokens within the game is dependent upon their perceived value to the game players. While most of these games have seen tremendous growth within their first year, the majority of tokenized universes then quickly fade into relative obscurity as a passing fad (Cuen). This issue of sustainability is a huge issue within the crypto world, but data scientist Angela Minster projects that in coming years a trend of user retention will be more pervasive (Cuen). Further, a long-standing industry standard holds that a niche app needs to meet a threshold of 500,000 subscribers for its long terms success to be considered plausible (Cuen). By

this standard, games involving NFTs are still distant from occupying a significant niche within the gaming sector, but their potential for growth upon mass adoption is staggering (Cuen).

**V. The Music Industry**

In terms of music, each new model geared towards the distribution of digitized music from Napster to iTunes to Spotify has been harnessed and corrupted by the major corporations within the music industry to profit off of the artist-fan relationship (Jollett). Additionally, the platforms themselves have displayed significant shortcomings in their royalty attribution systems and their ability to prevent piracy. In an attempt to disincentivize rampant piracy, the industry collectively agreed to lower the price of music (Jollett). This resulted in today's situation, where each of the several entities involved in the creation of a sound recording only earn fractions of pennies per stream or download (Jollett). This model somewhat works to generate significant revenue for those products in the short-head, but for artists in the long tail, those artists with small but dedicated fan bases, they would need to generate their main source of revenue elsewhere. For reference, 90% of all streaming goes to the top 1% of artists and 88% of the profits from their labor goes to another entity entirely (Jollett). By 2020, both major and cult artists were earning the majority of their income through live performances when the Coronavirus pandemic shut down the world. While major artists could rely on their streaming revenue, brainstorm the creation of new streams of income, and essentially wait out the storm, smaller artists went unemployed.

This predicament drastically increased the speed with which artists adopted NFTs as a tool to cut out the profit-guzzling intermediaries previously seen as essential. This new model

basically functions to give all artists, established or amateur, the ability to function as independents. Free from the regulation of record companies and distributors, NFTs would allow artists full creative control and the ability to retain a much higher percentage of their income. Additionally, because this digital economic system is governed solely by the principles of supply and demand the value of an artist's NFT is directly proportional to the value fans perceive that that piece adds to their lives. While the industry of the past was not built to empower artists, the platforms and systems of the future could be harnessed by artists to reap the profits they deserve based on the value of their music to their fans (Jollett). A song has the ability to change or save a life and that is definitely valued at more than fractions of a penny. For example, "Grimes, the EDM concept artist, sold $5.8 million worth of NFTs at the end of February, 3LAU, the white-hot DJ/EDM/remixer, also sold $11.6 million of NFTs last month [in February], and just last week [during the first week of March] Kings of Leon became the first major artist to release a record as an NFT. Steve Aoki, the DJ/Dance phenomenon, also sold $4.25 million worth of NFTs as of last Monday [Monday, March 8, 2021]" (Jollett). These NFTs were sold in the form of music videos, digital versions of the records themselves, and fan experiences such as backstage tours or a view into the artists' creative processes (Jollett). The NFT wave also appears to be relevant across all genres, as in recent weeks rappers Lil Yachty and Lil Pump have released social tokens on the platform "Creator Coin" designed by Rally Fyooz (Seward). Most recently, the alternative rock band Portugal. The Man has announced their intent to offer an audio archive in which fans can access unreleased music and gain entry into exclusive live streams (Seward). Fans will be able to access these experiences through the band's Discord server that already boasts 1,000+ users (Seward). Pertaining to all of the above offerings: fans who purchase these

tokens have essentially invested in the future of that artist or band. This means that the artist and the fan enter into a mutualistic relationship in which the fans have vested interest in the band's success while the artist works to increase their value so that the fan's 'stock' in them may rise. Alternatively, for those artists who may remain contractually bound to a legacy system, the software-development company Axis Point began building a "royalties management platform for music industry clients including Warner Music and EMI" earlier this year (Cuen). This project, dubbed YRTbox, will provide artists with personal accountability for their royalty-based income, a critical control in today's industry where the calculation, attribution, and payment of royalties is handled across so many platforms as to be frequently mishandled (Cuen).

**VI. The NBA**

The NBA is another media entity ripe to exploit the functions of a tokenized economy. In 2019, the NBA, in association with Dapper Labs, the creators of the original NFT-based commodities, announced their plans to release NBA Top Shot (Young). This blockchain-based, social experience/game would allow fans to purchase virtual trading cards featuring their favorite player's top game highlights as NFTs. Fans would then build a roster using these tokens and could compete against other fans in fantasy brackets. Alternatively, fans can opt to permanently possess the cards, exempting themselves from the game aspect of the platform. The uniqueness of each card is ensured by the blockchain, and similar to the music industry model, this market too is governed by supply and demand. If the market for digital trading cards behaves like the traditional trading card market, these cards should be viewed as extremely valuable appreciating assets (a 1952 Topps Mickey Mantle card just sold for $5.2 million) (Young). Currently, "packs"

sold to gain entry to the trading platform cost $9.00, and Top Shot has earned more than $230 million in sales as of February 28, 2021 (Young). Dapper Labs, the designers of the platform, earn revenues from the release of new NFT bundles and enjoy a percentage of each peer-to-peer transaction made on the blockchain (Young). In order to strike this deal with Dapper Labs, the NBA had to first consult the player's union as it was their likenesses facilitating the generation of revenue. The three entities agreed that Dapper Labs could yield a 10-15% cut off of the sales generated by leveraging this intellectual property, and according to digital asset research entity, The Block, the value of Dapper Labs has now risen to 2 billion dollars since cutting this deal with the NBA (Young). Dapper Labs, however, does not plan to stop there. Dapper has plans to continue expanding the capacity of the blockchain they (somewhat ironically) dubbed Flow by self-investing the capital earned through the deal (Young). The updates to the blockchain will allow the system to better support the capacity and demands of such a high-value marketplace (Young).

Players are also using NFTs to tokenize fan engagement, essentially creating their own form of direct-to-consumer revenue stream that excludes the NBA. In an effort spearheaded by Brooklyn Nets point guard Spencer Dinwiddie, players are experimenting with new models of fan engagement that involve fans buying into an athlete's revenue-generating potential. Simply put, when fans buy a player's NFTs (the value of which to fans will be discussed later) they are essentially buying out a portion of the athlete's contract with the NBA (Spencer Dinwiddie et al.). Dinwiddie himself has already democratized 13 million of his 3 year $34 million contract through tokenization (Seward and Cuen). So, what would fans be buying in these NFTs? Dinwiddie envisions the ownership of his tokens would include perks like "dividends, future

values, and asymmetrical yield curves" as well as offering utility values like special training camps and meet and greets (Seward and Cuen). Essentially, in owning a player's NFT you own stock in that player that will either increase or decrease in value based on their popularity in the market. From the player's perspective, this increases their performance drive as the more popularity they garner (through exceptional gameplay, charisma, or off-court activities) the more fans will pay to own that player's token. In sum, the democratization of one's contract creates the potential for the athlete to earn above his contractual income, and for fans to earn alongside them. Dinwiddie's original plan was to tokenize the entirety of his contract (Seward and Cuen). However, the NBA quickly shut down this idea, as this would drastically readjust the power dynamic in favor of the players. Although the players would still rely on the NBA (and its contracts with TV providers) for exposure, their branding and value within the market would now holistically depend upon the individual player. However, there are downsides to this model. The world's first glimpse of players communicating directly and intimately with fans came through social media. This provided players with more control over their personal branding than they had ever experienced previously; before, all an individual had to worry about in terms of image was what their local beat writer or larger sports publication wrote (Spencer Dinwiddie et al.). The NFT model would provide players with unprecedented omnipotence over their branding that could potentially cause severe damage to the incomes of players if a negative bout of PR were to surface. Simply, with more risk comes more reward but also a larger potential for disaster. Despite these risks, Dinwiddie continues to preach about the potential income stream the tokenization of one's contract can provide. In an interview with CoinDesk Dinwiddie stated, "anyone with public to semi-public cash flows and a fan base can participate" in expanding their

income potential using NFTs and the democratization of their contracts with their brokering entity (in this case the NBA) (Seward and Cuen). He continued by conceptualizing, “I envision a world where a Kevin Hart-token can trade for a Lebron James token, that can trade for a Serina Williams token. Because we’re all our own business, each token will have its own perks attached to it” (Seward and Cuen).

**VII. Legal Issues**

Clearly, an industry in its conceptual infancy, the legal infrastructure that will govern these systems has yet to be determined. Because of the decentralized nature of the system, immediately issues regarding the enforcement of any regulation arise. In terms of consumer protection and disclosure regulations, there are major concerns regarding the proper education of consumers. Clearly, NFTs are conceptually difficult to understand in their totality and current law dictates that consumers must be entirely aware of what it is they’re buying and their rights upon purchase (De). Additionally, an entity would need to be established to prevent money laundering and to prevent any third parties from harvesting consumer data stored in the blockchain (already a huge privacy concern in online industries) (De). Further concerns arise when considering the international nature of the digital markets. Current sanctions laws regulate physical trade between nations, but how would these laws apply to a tokenized economy? Experts posit that it could be illegal for an NFT originating in a sanctioned nation like Iran or North Korea to be purchased in the United States and by extension its continued commodification in secondary markets (De). In terms of copyright and intellectual property law, artists maintain that they would retain the copyright to their tokenized works (De). Mike Shinoda, one of the founding musicians

behind Linkin Park, told Input Magazine that "there's nobody who's serious about NFTs who really humors the idea that what you're selling is the copyright or the master," although no court has yet confirmed this posturing (De). In this model, the purchase of an NFT would function as a kind of licensing agreement between the creator and the consumer, rather than a hard and fast sale. If a court determines that what is being sold *is* the copyright, this would pose potentially catastrophic complications for various tokenized media-related industries. The counterfeiting of tokenized goods is another potential pitfall for these industries. It is possible that an individual could sell an NFT linked to a real-world item that does not exist, or what appears as a digital asset that has no actual utility (De). Additionally, an NFT could be sold advertising its linkage to one blockchain when it's actually connected to another. Basically, a user could be selling multiple copies of the same asset that in reality only exists once. Lastly, a user could advertise an online asset as an NFT, and the item could not be linked to a blockchain at all (De). The last legal concern of note involves securities and tax laws. These laws will need to be adjusted to account for this new form of asset which will likely not take place until the marketplace for these goods is more mature and the prices of goods more stable (De). Because of the decentralized nature of the marketplace, issues have also arisen concerning what entity would be charged with collecting such taxes (De). Lastly, as with physical goods, there's the issue of how these tokens would be dealt with across tax regimes in different jurisdictions (De).

**VIII. The Future of NFTs / Limits**

Other factors limiting the mass adoption of NFTs involve the technology itself and market conditions. It's possible the tokenized assets may encounter public resistance to *digital*

ownership. In other words, the potential market may be limited by those who cannot perceive the true ownership value in a digital asset (as NFTs cannot be physically possessed), and still others who are troubled by their inability to physically display the asset (Chevet). However, in recent years digital galleries, analogs to the museums or physical galleries of today for which an entry fee is paid, have been popping up across the internet to display these crypto collectibles (Chevet). Additionally, several issues have been pointed out involving the backbone of all crypto technology: the blockchain. This technology has a scaling problem. The Bitcoin blockchain can only handle 7 transactions per second (Chevet). For reference, a centralized system like Visa boasts a transaction speed of 20,000 per second (Chevet). This disparity is due to blockchain's prioritization of decentralization and security. To address this issue, proof-of-stake algorithms are expected to be applied to different blockchains, but even with these, the theoretical maximum transaction speed for blockchain technology is much slower than that of a centralized system (Chevet). Further, an enormous amount of computing power is necessary in order to maintain the blockchain. Currently, the Bitcoin blockchain alone consumes 0.5% of the world's electricity, although addressing the scaling issue discussed above should help to lower this statistic (Chevet). At present, blockchain technology presents few real-world applications. Due to the legal uncertainties surrounding the technology, it's difficult for blockchain systems to compete with or integrate themselves into the networks of established centralized businesses (Chevet). Experts posit that for blockchain technology to become widespread, it will need to become invisible much like every other internet protocol currently in use (Chevet). Moreover, blockchains only have value and can only be sold and traded within the system upon which they were initially created (Chevet). For blockchain technology to succeed tokens will need to have value when

traded between systems (this value will be adjusted based on the health of the overall economic ecosystem of the platform). Lastly, because this technology is so foreign to many, it's extremely hard for customers to trust blockchain technology enough to invest in it. These barriers will have to be broken down in order to clear a path for the mass adoption of crypto collectibles.

On the other hand, several potential avenues exist for NFTs to breach what Geoffery Moore refers to as "the chasm" or what Malcolm Gladwell refers to as "the tipping point." Jesse Walden believes that the mass adoption of NFTs is inevitable and that they will serve as the "port of entry to all internet media because everyone involved can make more money from the markets they enable." According to research, the early majority (10%) of Americans currently own digital currency, and according to Walden, the infrastructure now exists for these technologies to go mainstream. In terms of possibilities to expand the market, a major step for crypto technology would be its integration into the operational models of today's established businesses. In recent weeks, United States senator Sherrod Brown has advocated for the adoption of the digital dollar as a national currency (De). Brown advocates on the platform that centralized banking using a digital currency is essential to the "[modernization of] the US's real-time payments infrastructure." Obviously, the use of crypto technology in this way would ensure its mass adoption. Further, the ability to link NFTs to physical assets (currently a technology in development), would decrease liquidity in markets where the commodity in its physical form is difficult to access or locate (Chevet). Lastly, the development of a new form of crypto collectible, the crypto composable, could transform the technology's utility, propelling it to mass adoption. The crypto composable would allow the owners of digital assets across blockchains to

combine them virtually to create a new asset (Chevet). The possibilities this technology could unlock are endless and could increase liquidity greatly in secondary markets.

Another indication of how the future of NFTs will play out is how investment entities like Forbes view the asset. Within the past few months, the fast money earned by several NFT platforms has thrust the infantile industry into the spotlight. In a recent article, Forbes warned against the scams that often pop up around nominally incredible investment opportunities that seemingly appear out of thin air (Farrington). Forbes cited the Initial Coin Offering (ICO) craze of 2017 where many offerings were found to be fraudulent and many people who had invested unaware of the specifics of the product and the market forces that governed the technical landscape of the time lost large sums of money in their investments (Farrington). Basically, Forbes warns against investment in crypto assets just yet as the market is too young and too volatile at this stage in its development (Farrington). However, Forbes also notes that the value of NFTs is entirely dependent on the value their market assigns them (Farrington). If NFTs are adopted into the infrastructures of existing industries as their primary internet protocols and can sufficiently add value to the processes of authentication, increasing market liquidity and ease of ownership, Forbes and other experts predict the mass adoption of several legitimate crypto assets (Farrington).

## IX. Conclusion

It should be of no surprise that cryptocurrencies and non-fungible tokens are ascendent in today's culture. Generations raised "online" are now in early adulthood and are crafting solutions to today's problems using cutting-edge technologies, the potential uses of which are essentially

boundless. While some posit crypto technologies will be obsolete within years and others believe they are well on their way to mass adoption, it's clear that the effects crypto technology had on the value chains of creative industries will not soon be forgotten even if this technology does not ultimately provide an avenue to complete disintermediation.

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