

WTF are NFTs, Smart Contracts, and Tokens? How Blockchain Tech Disrupts the Music Industry to Empower Artists

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Abstract

WTF are NFTs? When society as a whole uses acronyms to express themselves...OMG, LOL or mho, there's something either completely amiss (teenagers are running the world) or tech has gotten a hold of us all (robots are running the world) Seriously, kids, you've gotta get hip to that tech—it literally changes your virtual reality.

A Non-Fungible Token or NFT is a unique digital identifier that can be used to authenticate ownership of a digital asset. Non-fungible means it cannot be exchanged for something identical to it. Whereas, a fungible (or exchangeable) token like Bitcoin or a dollar bill are all worth the same amount and can be easily exchanged (Coinbase). Every NFT purchase is essentially a limited numbered, “hand-autographed” item by the artist or a piece of original artwork.

The artist creates a work of art (music, film, album cover) and makes it available through auction on sites like [OpenSea.com](#) or [SuperRare](#) and sells it to the highest bidder. Smart contracts allow the artist to put their music up for sale or license and when a vendor wants to put it in a film or video game they go to the site, use their crypto wallet to authenticate who they are and purchase the product directly from the artist. The sale is verified on the blockchain and both wallets anonymize the purchasers but show the transaction on the blockchain. If you don't know WTF an NFT is, then this is the paper for you.

Keywords: non-fungible token, NFT, music licensing, digital assets, smart contracts, blockchain

WTF are NFTs?

NFTs (or “non-fungible tokens”) are a special kind of crypto asset in which each token is unique—as opposed to “fungible” assets like Bitcoin and dollar bills, which are all worth exactly the same amount. (Coinbase 2022)

Every NFT is unique and thus creates value through its scarcity. Digital assets like artworks, recordings, music, in-game tokens, virtual real estate or digital pets can all be NFTs. (Kramer, Graves and Phillips 2022)

Every NFT purchase is essentially a limited numbered, hand autographed item by the artist. Valuable, right? Trent Reznor of NIN understood this tenet of marketing. In 2008, he released *Ghosts I-IV* as a limited edition Ultra Deluxe DVD/CD/Vinyl box set with a numbered book of lithographs (not unique) but Trent signed each one of the books giving fans a connection to his signature (creating value) and then made a YouTube video of him signing the books to authenticate his signature (so fans could trust that what they had was real). Here is a great video of him signing the books 2.500 times (<https://youtu.be/0AcGtmJoJOI>). He put them on sale on his website for \$300 in March of 2008, cut out his middleman (label) and made \$750,000 overnight (NIN 2008) (N. Anderson 2008).

He understood his fan base, and made a wide sales offering that included a free download all the way up to the \$300 Ultra Deluxe boxed set so *every fan* could be connected to him in a way *each* could afford.

NFTs are like this. The artist creates a work of art (music, film, artwork) and makes it available through auction on sites like [OpenSea.io](#) or [SuperRare.com](#) and sells it to the highest bidder. The sale is verified on the blockchain



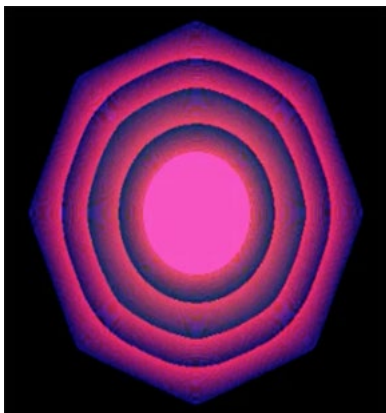
Ultra Deluxe Edition Packaging of *Ghosts I-IV* (Reznor 2021).

and both wallets anonymize the purchasers but show the transaction on the blockchain. Legit transfer of copyright (ownership) in a few easy steps!

Think about the early days of Sims or Second Life purchases. You used real money to decorate your virtual living room with a Monet inspired print, but so could everyone else. It wasn't unique. It was a "print" just like the print of the Pixies album cover you had on your wall in college. Ten bucks and every punk ass college freshman could be "cool". NFTs raise the stakes. You can purchase a one-of-a-kind, digitized piece of art that is authenticated by the artist when they officially upload it to the blockchain-based marketplace. Again, the ownership is authenticated and forever recorded on the distributed ledger. The art becomes an investment and the value increases as the artist becomes more popular.

Now fans are signing onto the Metaverse on sites like [Decentraland](#), and are spending real money to buy land, build their house, and decorate it with NFT artwork. Crazy right? The first NFTs weren't divided but now creators have learned how to fractionalize them through a smart contract. More on that later.

The First NFT

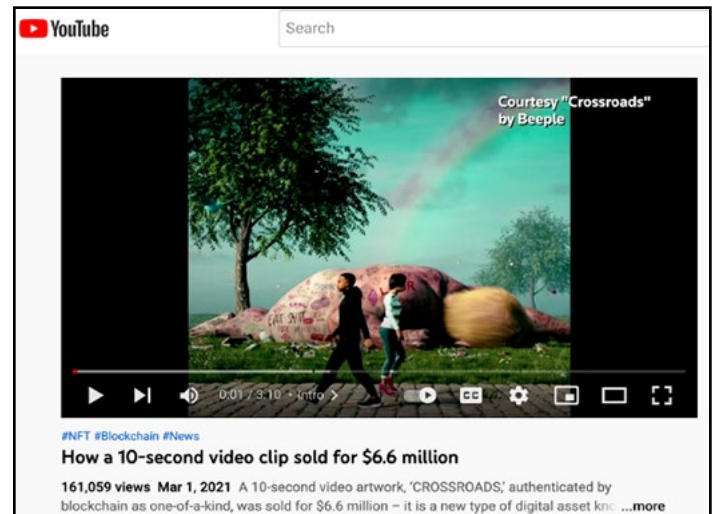


A still from the first NFT, *Quantum*, by Kevin McCoy (Ludel 2022).

This is the first NFT, minted (created) in 2014 by Kevin McCoy on the [Namecoin blockchain](#). He first called this a "monetized graphic" (Ludel 2022). He wanted to address

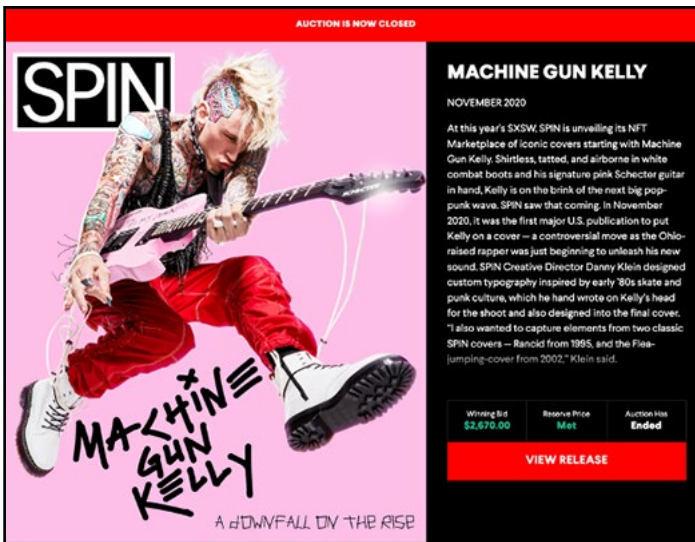
that digital art is "posted, downloaded, and reposted in a way that often cuts out the artist" so he created this digital art NFT so the artist and the creation would be connected and they would earn the income from the sale of their art. (Lindahl 2022). Ben Arnon, Co-founder and Co-CEO of NFT platform Curio sees NFTs and the link between web 2.0 and 3.0 meaning that monetization is in the hands of the owner rather than the platform, although of course the platform makes transaction fees from the sale. McCoy was actually sued by a Canadian company called Free Holdings when he sold *Quantum* through Sotheby's in the "Natively Digital" auction for \$1.5 million. McCoy created the NFT using Namecoin, a software platform that requires that members renew their ownership of their creations every 250 days (Escalante-del Mattei 2022). When the sale began to get attention, Free Holdings registered as the owners of the dormant Namecoin because of the metadata stored on their site. McCoy actually created a new, Ethereum-based NFT of *Quantum* to sell at the Sotheby's auction, so the claim that Free Holdings owned the metadata from the old Namecoin, and that he had sold *that* NFT, was unfounded. You can see how we are entering new intellectual property ownership terms with the invention of these new technologies.

Digital Art NFTs – Beeple



Screenshot of the Beeple ten-second video that sold for \$6.6 Million (Reuters 2021).

Once the NFT craze began in 2020, an artist known as Beeple sold his ten-second NFT video of a naked Donald Trump (see above) for \$67,000 to a Miami art collector named Pablo Rodriguez-Fraile. Four months later, in February 2021, this video exchanged hands again online for \$6.6 million (Reuters 2021). In addition to these sales, Christie's auction house offered a collage of 5,000 "all-digital" works by Beeple (aka Mike Winkelmann) and it sold for \$69 million on March 11, 2021 (Palumbo, Chung, and Ogura 2021) (Howcroft and Carvalho 2021).



Screenshot of *Spin* NFT of Machine Gun Kelly magazine cover, November 2020 (Spin 2022) (Spin Staff 2022).

Magazine Covers Digitized as NFTs

Here's another great example: magazine covers from *Spin*, digitized as an NFT. *Spin* magazine got into the NFT game at SXSW in March of 2022. It featured its own magazine covers as NFTs starting with this one of Machine Gun Kelly (Spin Staff 2022). Each of the magazine covers are made into a limited NFT with one going to the winning bidder, the second to the featured artist, and the third to the nonprofit of the artist's choosing. Two additional copies are held in *Spin* and NAX's treasury. AX, (Netzwerk Architekturexport) (Spin 2022). *Spin* worked with NAX, Algorand, and Rocket Insights to create the offerings.

Fans can buy the covers with a credit card (yes, not crypto), so it seems like this NFT exchange is actually Web 2.0—an internet website, rather than Web 3.0 which would be on the blockchain. I tried to see what was available for purchase on their site, located [here](https://spinnft.xyz/) (https://spinnft.xyz/) but there aren't currently any NFTs available. Maybe legal is working on all of those image and likeness clearances for this new tech before they sell another one... lol.

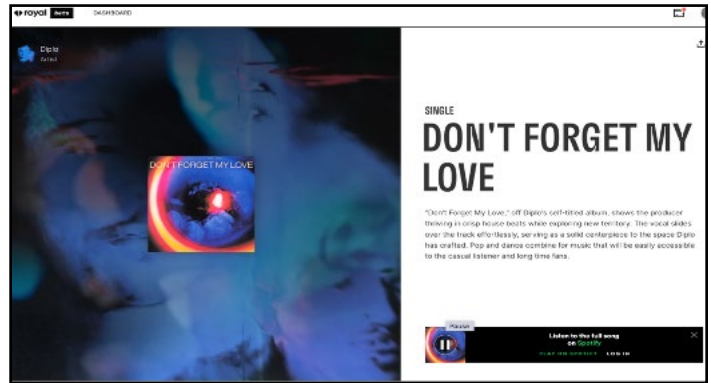
We're excited to introduce these famous pieces as NFTs. It's an easy entry point for fans to begin to collect scarce and coveted digital photography and memorabilia while providing artists a way into the space. (Jimmy Hutcheson, CEO of *Spin*) (Spin Staff)

WTF Can I Do to Make Money with An NFT?

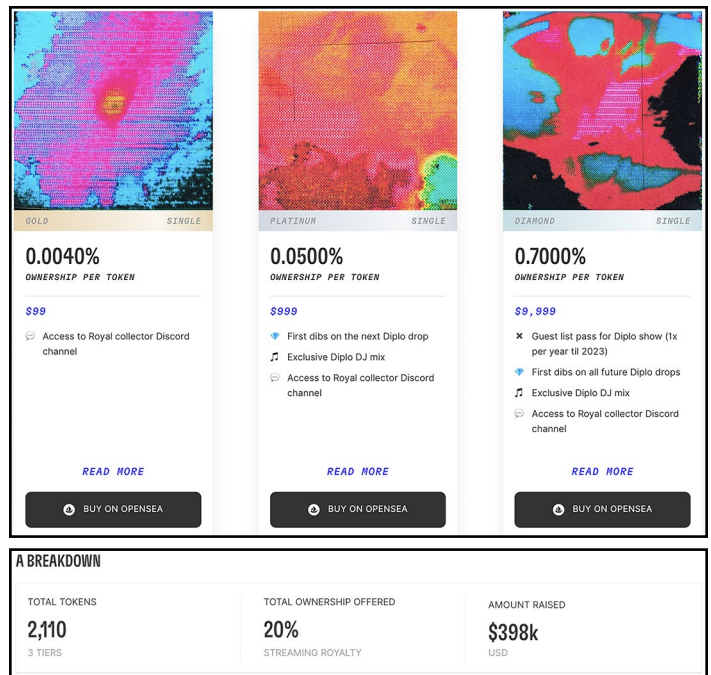
Ok, cool, magazine covers as art, music albums, short video visualizations that are basically a .gif. I get it, but how do I take my music copyrights to the next level? Enter Diplo and fractionalized and tokenized royalty shares. Show. Me. The. Money!

Diplo "Don't Forget My Love" Fractionalized Royalty Shares

Here's an example of Diplo's "Don't Forget My Love" NFT which includes the song, a video visualization and a fractionalized ownership "share" of his streaming royalties from the song. It is for sale on the popular NFT Marketplace [Royal Markets](https://royal.io/editions/diplo-dontforgetmylove) (https://royal.io/editions/diplo-dontforgetmylove) (Royal Markets 2022).



Screenshot of Diplo's "Don't Forget My Love" on the Royal Markets NFT Marketplace (Royal Markets 2022).



Screenshots from Diplo's "Don't Forget My Love" Ownership Levels.

NFT Marketplace – Royal Market – A Tokenized Song NFT

Here's how it works: Royal Tokens give the investor a share of a song's streaming income (not download, physical, or synchronization revenue) plus access to exclusive content and benefits. It does not give the investor any own-

ership of the actual PA (Composition) or SR Copyrights (Sound Recording). Ownership percentage and extras vary across each tier, and Royal notifies investors when royalties are available to claim after the artist gets paid. Typically, it's an 80/20 split with the artist keeping 80% and tokenizing 20% of the copyright. Here are the membership levels, and you'll note that the most valuable \$10,000 gives the fan the coveted "connection" with the artist with a guest pass to his show in both 2022 and 2023. The [discord channel](https://discord.com/) <https://discord.com/> at the \$999 level does offer some virtual connection as it is like a private online club with chat and video access to the star (Discord 2022).

Royal Market – How's The Money Work?

So how does the money work? I found this great article on *Visual Capitalist* which outlines "How Many Music Streams Does It Take to Earn a Dollar?" (Routley, Deshmukh, and Conte 2019) and based on that, I calculated what each ownership tier will earn using the Spotify rate listed there of \$0.00437 (See below). Notice how many streams are needed for an artist to make minimum wage... more than 336,000 a month! to make \$1,472! Yeah, that's not going to pay your rent, is it? It's pretty sad because a report last year by *Music Business Worldwide* showed that only 13,000 artists worldwide make a living wage of at least \$50,000 a year (Ingham 2021). Big sigh... 250 streams on Spotify to make a dollar? Fractional ownership of the streams doesn't look that great to me, but let's dig into the numbers.

Streaming service	Avg. payout per stream	# of streams to earn one dollar	# of streams to earn minimum wage*
Napster	\$0.019	53	77,474
Tidal	\$0.0125	80	117,760
Apple Music	\$0.00735	136	200,272
Google Play Music	\$0.00676	147	217,751
Deezer	\$0.0064	156	230,000
Spotify	\$0.00437	229	336,842
Amazon	\$0.00402	249	366,169
Pandora**	\$0.00133	752	1,106,767
YouTube	\$0.00069	1,449	2,133,333

*U.S. monthly minimum wage of \$1,472 **Premium tier

How many streams to earn minimum wage (Routley, Deshmukh, and Conte 2019).

When you think about what your professors are doing on their weekends, it's crazy s**t like this. Yeah, I love math, so I calculated it for you below. ROTFL. I'm crazy like that, and no, I'm not going to grade your paper that you turned in three weeks late. I've got important stuff to do like calculate royalties for an NFT I will never own.

Diplo Fractionalized Royalty Payouts – “Don't Forget My Love”

“Don't Forget My Love” had 18,500,371 streams as of April 15, 2022. 18 million? Not bad! I multiplied that by \$0.00437 (Spotify payout rate from above) and the song has earned \$80,846.62. Now multiply that by the 20% going to the token holders and you have a whopping \$16,169.32. (Wha, wah—play trombone sound). Yeah, it's not real impressive, is it? Let's go through the calculations for each level to see how soon you're gonna get rich. Or not. You can thank me later for not allowing your head to explode.

To calculate the Gold Level, I took the payout percentage of .004 x 2,000 tokens which were sold at this level. I got 8% of the 20% payout which means that 40% of the income is being allocated to the Gold Level. Did you just lose your mind there for a minute? Yeah, me too. Here's the money, honey.

Total amount going to token holders x percentage share for that tier, gives you the total amount of money being distributed to those tokens. In this case, the \$16,169.32 is multiplied by the 40% of the payout designated to this level which is a whopping \$6,467.73. Divide that by the 2,000 tokens which were sold at this level and the income is a lovely \$3.23 per token. It was purchased at \$99. We've got a way to go until we recoup our investment.

$$\$16,169.32 \times .40 = \$6,467.73 / 2000 \text{ tokens sold at this level is } \$3.23 \text{ per token income.}$$

To calculate the Platinum Level, I took the payout percentage of .05 x 100 tokens and got 5% of the 20% payout, which means that 25% of the income is being allocated to the Platinum Level. Again, we take the overall payout of \$16,169.32 and multiply it by the 25% allocation to Platinum shareholders and get \$4,042.33. It is divided by the 100 tokens in the Platinum level which is \$40.42 income per token toward recouping the \$999 that you spent.

$$16,169.32 \times .25 = \$4,042.33 / 100 \text{ tokens} = \$40.42 \text{ per token (purchased at } \$999).$$

Finally, to calculate the Diamond Level, I took the payout percentage of .7 x 10 tokens and got 7% of the 20% which is 35% of the share going to Diamond Level token holders. The 35% share of the \$16,169.32 is \$5,659.25 and divided by the 10 tokens in the Diamond Level you have earned \$565.93 per token toward your purchase of \$9,999.

$$\$16,169.32 \times .35 = \$5,659.26 / 10 \text{ tokens} = \$565.93 \text{ (purchased at } \$9,999)$$

250 streams on spotify to make a dollar (\$0.00437)/stream

#10 song Don't Forget My Love

18,500,371 streams x \$0.00437 = \$80,846.62 Earned

\$16,169.32 (20% share going to tokens)

Gold (.004%) = 8% of 20% is (40% of the share)

\$16,169.32 x .40 = \$6,467.73 / 2000 tokens = \$3.23/token

Platinum (.05) = 5% of 20% is (25% of the share)

\$16,169.32 x .25 = \$4,042.33/100 tokens = \$40.42/token

Diamond (.7) = 7% of 20% (35% of the share)

\$16,169.32 x .35 = \$5,659.26/10 tokens = \$565.93

Calculations of gold, platinum, and diamond levels for Diplo's "Don't Forget My Love" fractional NFT (Johnson 2022).

Let's compare that to a song being synced in a major motion picture for \$1,000,000 and 20% of that income (\$200K) was given out token holders.

- **Gold Level:** 40% is \$80,000 divided by 2,000 tokens. Each token gets \$40
- **Platinum Level:** 25% is \$50,000 divided by 100 tokens. Each token gets \$500
- **Diamond Level:** 35% is \$70,000 divided by 10 tokens. Each token gets \$7000

Not bad. Finally, if we look at one of Diplo's other songs "Genius" recorded with Sia and Labrinth, which as of this writing has earned 351,110,928 plays, we can postulate that when "Don't Forget My Love" has had more time to gather plays—it will make similar income. The money looks pretty good.

Diplo "Genius" Fractionalized Royalty Payouts

We took these streaming numbers from the Spotify snapshot above. "Genius" had 351,110,928 streams x .00437 per stream and you get \$1,534,354.76 total income. 20% of that going to the shareholders is \$1,534,354.76 x .20 = \$306,870.95

Gold Level Calculations (40% Allocated)

\$306,870.95 x .40 = \$122,748.38

\$122,748.38 / 2000 tokens = \$61.37 per token

Gold Level has made back over half the money you invested on your \$99 token.

Platinum Level Calculations (25% Allocated)

\$306,870.95 x .25 = \$76,717.74

\$76,717.74 / 100 tokens = \$767.18 per token

You haven't quite broken even on the \$999 you spent for the token

Diamond Level Calculations (35% Allocated)

\$306,870.95 x .35 = \$107,404.83

\$107,404.83 / 10 tokens = \$10,740.48 per token

You are just barely breaking even for investment of \$9,999

If you look at his most popular song at that time which was "Where Are You Now" with Justin Bieber, it had 957,117,370 streams on Spotify (three times as many as "Genius"). If that song had been fractionalized as this one had been, the Diamond Level owners of that song would have earned \$29,278.22, almost tripling the return on their investment! So, this fractionalized NFT thing might not be bad at all. Jump on the bandwagon kids, mama needs a new pair of shoes!

Tokenized Song NFT vs. Fractional NFT

Cryptopunks and The Bored Ape Yacht Club are popular NFT artworks that have attracted the interest of celebrities and driven up the price, with some being sold individually for over \$11 million! (Bybit 2022) That's Beyonce money! The elite use them as social media avatars or "club keys" to private engagements, so we are not getting into the party in Ibiza anytime soon. This has kept mere mortals out of the crypto buying space because of the prohibitive price and has limited what an investor can do with their NFT.

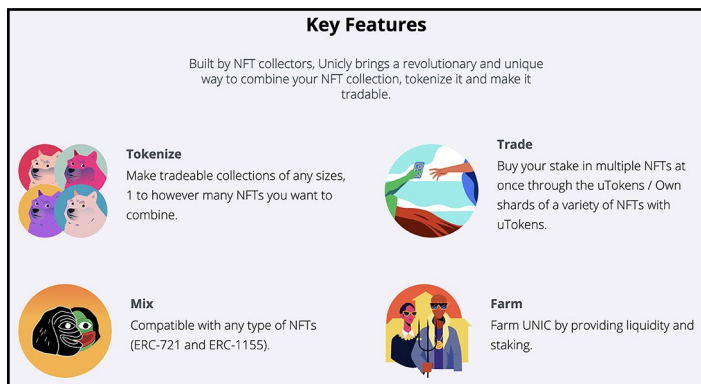
The Bored Ape Yacht Club is one of the most prestigious NFT collections in the world. A collection of 10,000 NFTs, each depicting an ape with different traits and visual attributes, Jimmy Fallon, Steph Curry and Post Malone are among their star-studded owners. Right now, the price of entry is 52 ether, or \$210,000. (Van Boom 2022)

Fractionalized NFT (F-NFT) to the rescue! A tokenized song NFT like the Diplo song above gives investors the opportunity to share in the revenue from the success of a work, though not ownership of the copyright. A similar concept is a fractionalized NFT which gives partial ownership of a copyright, as well as the ability to earn income through sales of their fractional "share" of that intellectual property. (Bybit 2022) Think about it as an investment group for the Mona Lisa. The "property" whether it be a song, movie, or piece of art is fractionalized in a smart contract with a set number of tokens.

Where Can I Buy A Fractional NFT?

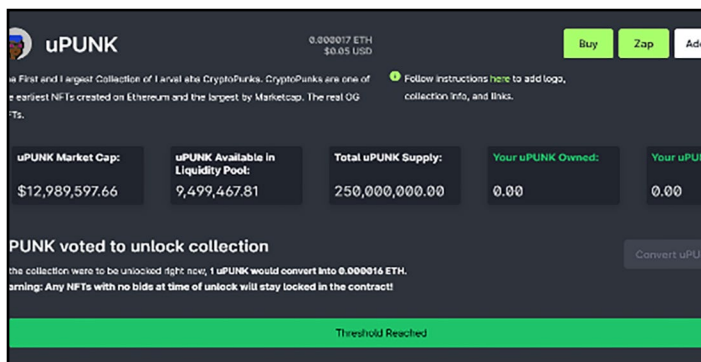
Oh, so now you are beginning to understand this investment thing, huh? You wanna get into the game? Three of the most popular investment platforms are [Otis](#), [Unicly](#), and [Fractional.art](#). All of them allow users to invest in fraction-

alized NFTs. Unicy allows investors to tokenize NFTs they already own, and Fractional.art allows creators to mint their own fractionalized NFT.



Key features of the Unicy platform NFTs (Unic.ly 2022).

Cryptopunks tokenized 50 of their 10,000 NFTs into 250 million uPunks tokens using the Unicy platform in April 2021 (Ibid). Mutant Cats tokens, called \$FISH, can be staked to earn 10 \$FISH per day or used to vote on the Mutant Cat DAO. This is hilarious...



uPunk tokenization of the 50 of the Cyberpunks 10,000 NFTs (Cyberpunks 2022).

The Wide, Wide World of NFTs

Sport NFTs – Tokenized Video of Tony Hawk

NFTs don't only pertain to music and art, you can also find them in sports. One of the many celebrities to get into the NFT space is skateboarder Tony Hawk. He released the last footage of him performing his famous 540-degree ollie as an NFT via Ethernity Chain. Check it out here on his Instagram page <https://www.instagram.com/p/CMitq3HJL-7/> (Hawk 2021).

Music NFTs as Concert Tickets and Albums

In the music space, the Kings of Leon created three different NFT experiences for their fans in March of 2021 through the Yellowheart platform <https://yh.io/> (YellowHeart, LLC 2022). Meetsa Kasa from Blockade Games even posted a [video on how to purchase](#) them so fans could understand this new technology (Kasa).

First, they minted a tokenized NFT for their album *When*

You See Yourself. It included the digital album, the vinyl, and an animated album cover, which netted them \$2,000,000 (Dedezade 2021). The second NFT was a golden concert ticket auction to buy four front row seats to all of their concerts for life. The last NFT offer allows fans to “mint” (at their own expense) as many *When You See Yourself* NFTs as they want and at the end of March, that finite pool would become collector’s items (Gottsegen 2021).

Unfortunately, there was some blowback from fans in the comments about the gas fees on the Ethereum platform being more expensive than the album, which would impinge on the success of future music NFT offerings.



Complaints from fans on Kings of Leon NFT “gas fees” (Kasa 2021).

Hollywood NFTs – “The Glue Factory”

NFTs are also being used to fund television and film projects in Hollywood. “The Glue Factory,” an animated web comedy voiced by Ted Danson, Patton Oswalt, Bobby Moynihan, and Bobby Lee minted 10,000 NFTs on the Ethereum blockchain and fans funded the series to the tune of \$3,000,000 (Lindahl 2022).

It even included input on the writing from fans. (A great way to connect with fans!) Token holders participated in various writing assignments through the Glue Factory’s discord server. The writers and showrunner Jon Barinholtz reviewed the ideas in a live video chat with the token holders.

We see that the engagement of the fans was key to developing the storylines but the staff writers said that the NFT owners proved that the show concept was valuable, had a fan base prior to the release, and could convince a network exec to “pick up the show.”

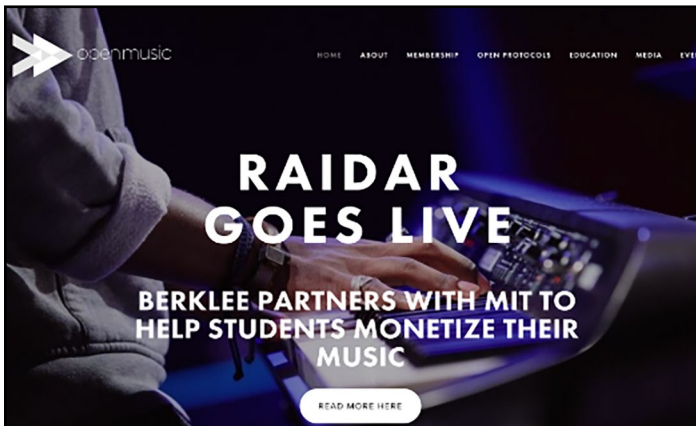
Chris Lindhal postulates that, “Initial tokens could be sold at a premium to others eager to be a part of the community. The earliest iteration of an NFT project is like a first-edition cult comic book that goes on to fuel TV shows and blockbuster adaptations.” Arnon said, “In the future, we’re really thinking that the NFT landscape will also be a breeding ground for the IP that ultimately makes its way into film, TV, and publishing.” So, this new NFT technology is lead-

ing the way in funding the development of art as well as creating the content for more developed storylines in film and television.

WTF is Sync Licensing on the Blockchain?

So where does that leave us in administering the intellectual property rights of these new media vehicles? We've seen how smart contracts within the NFT can allow artists to sell multiple units of art like a copy of an album, tokenized royalty streams from a piece of music or fractionalized ownership of a piece of art or song. What do we do when an artist wants to license a song for a film, a video game, a commercial, podcast, or television show? How do we automate it on the blockchain? Well, my colleague George Howard has been innovating a way to create a smart sync license so vendors can buy music from a catalog using their crypto wallet to authenticate who they are and purchase the music directly from the artist to put in their film.

RAIDAR Music Platform – Smart Contract Beta



Berklee College of Music Announces RAIDAR Blockchain Platform (Open Music Initiative 2020).

In 2019, George Howard, Professor of Music Business at Berklee College of Music began working on a blockchain smart sync license by building the RAIDAR (Rights and Asset Information in Decentralized, Authoritative Repositories) platform with Berklee and MIT students (Raidar 2021).

RAIDAR would license songs from Berklee students to visual media students at Lesley University first and then make the platform available to outside vendors for music placement in games, podcasts, and virtual reality. RAIDAR was first built on the Ethereum platform but decided to move to the Algorand Blockchain in fall of 2022 to be carbon neutral. The platform works like a production music library with search tools for beats per minute, mood, genre, key, or hashtags. All of the music is owned 100% by the students, and RAIDAR does not earn any income from the sales. When a student filmmaker goes to the site, they can search for “guitar driven screamo with cookie monstah vo-

cal.” I’d like to see what comes up for that search! A list of songs meeting their criteria for genre, or instrument, or beats per minute shows up as a list. You can listen to each track to decide what you want to buy. The smart contract currently has only one rate of \$50, so when the song is selected and purchased, the film student will sign into their crypto wallet, pay the \$50 and receive a download of the song and a copy of the license iterating the terms. The music creator’s wallet will increase by \$50 and they just licensed their music, kept ownership of their copyright and didn’t have to pay anyone to do the administration! Eureka! They set it up once on the blockchain and now thousands of sales can take place without their intervention. By Jove, I think we’ve got it!

The goal was to create “a tool for artist education and career sovereignty.” (George Howard)

RAIDAR is supported by grants through Open Music, Algorand, and other investors. Read the [white paper](#) on OMI’s partnership with the Industry to create an “Open and Scalable Metadata Layer” (Hardjono and d’Avis 2019).

As I said at the beginning, the RAIDAR blockchain is still in beta, and is awaiting further funding and development for all of these payments to issue on the blockchain. It’s no longer a theory though because the first smart contract was actually launched on the Algorand blockchain eight months ago by my very own colleague George Howard.

Dequency.io – The Smart Contract Realized

After Professor Howard got the Beta version of RAIDAR up and running he launched a new commercial sync licensing company called [Dequency.io](#). Dequency, “the soundtrack to the Metaverse” is a blockchain music platform (that works similar to a production music library) but is waaaayyy cooler! Musicians upload music for licensing and visual artists search the database to find music for NFTs and Metaverse content. Dequency licenses are minted on the Algorand blockchain to keep things low cost and carbon neutral and are paid for using ALGO coins. Check out the [marketplace](#) (Dequency.io 2022).

The smart contracts facilitate instant payments to creators and cut out the middleman to reduce administration fees in traditional music licensing companies. George says, “My favorite part of this platform is the proof-of-taste protocol. It allows ‘community members,’ or ‘Tastemakers’ to earn cryptocurrency by contributing to assessments of music quality, potential popularity, and relevance to the platform and community” (Dequency.io).

WTF is the Metaverse?

A Quick His/Her/Theirstory of Web 1.0, 2.0, and 3.0

To help you understand the Metaverse we need to talk about the transition from Web 2.0 to Web 3.0 (Li 2022). Web 1.0 was the invention of the internet for consumer use in the 1990s to 2000s with static websites and dial up bbs services that “hosted” online chats. If you were around then, you remember how laughable that “connection” was, and how desperate we all were to use this new technology. I can still hear the faint dial up tones squawking back at me as I waited to logon with my 9600 baud modem over my (not high speed) telephone line. It sounded somewhat like loud static followed by the backup sound that a construction truck makes. Here’s a YouTube video of the [sound](#) just to make you laugh and empathize with us GenXers who had to suffer through that difficult and trying time (Wilterminus 2008).

Once you were online, you waited in a virtual room (a black screen with orange DOS-based-looking script) for someone to show up and type “hi” to you. Yeah, kids, you don’t even know. Text only at first, which developed into some really great 8 bit ANSI graphics (much later on btw). We were totally “stoked” (to use an 80s phrase) to even have another person somewhere out there, on the other side of the world show up in a chat room to say “hi”. We talked about music, films, books and pretty much nothing just like you do today on “faceogram”. Here’s a great article from the [Atlantic](#) about the early days of dial up (Edwards 2016).

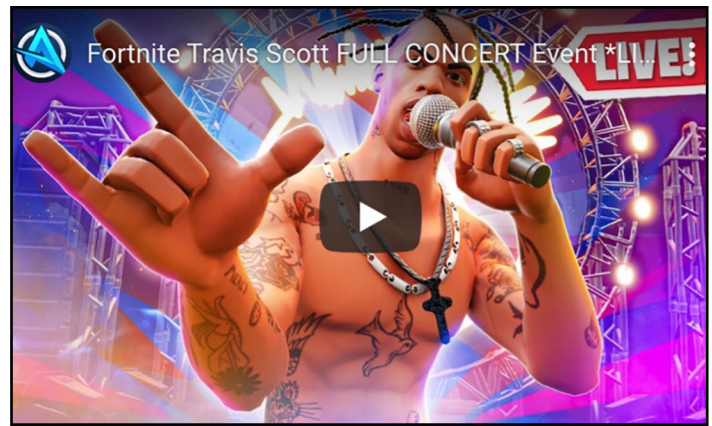
Oxford dictionary defines Web 2.0 as the “second stage of the development of the world wide web, characterized specifically by the change from static web pages to dynamic or user generated content and the growth of social media” (Oxford University Press 2022). It’s basically where we are now with the current version of the internet. Web 3.0 is the next generation of the web which is decentralized and open source (Li 2022).

The Metaverse

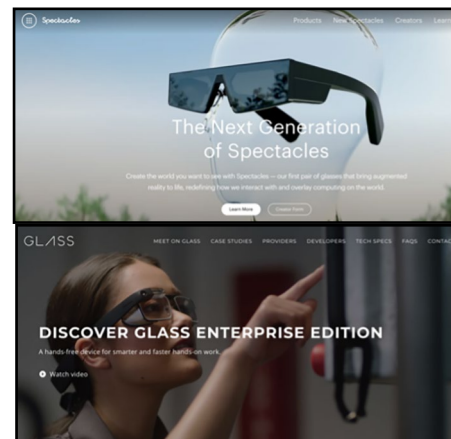
Facebook might have taken on the new name Meta but Facebook is *not* the Metaverse. Check out their take on it [here](#) (Meta 2021). The Metaverse is a broad term for the digital online economy that uses decentralized, blockchain-based programming and can include virtual or augmented reality (Ravenscraft 2022). Some would say it includes virtual concert experiences like Travis Scott’s performance in Fortnite, which you can watch here on [YouTube](#) (Dredge 2020).

It includes augmented reality which is a blend of real and virtual reality using tools like Google [Glass](#) (Google 2022) or [SNAP](#) (Snap, Inc. 2022) (Axon 2021). It enhances your daily life with an Instagram feed, phone calls, and messaging at the blink of an eye.

It could even be holograms with sensory suits interact-



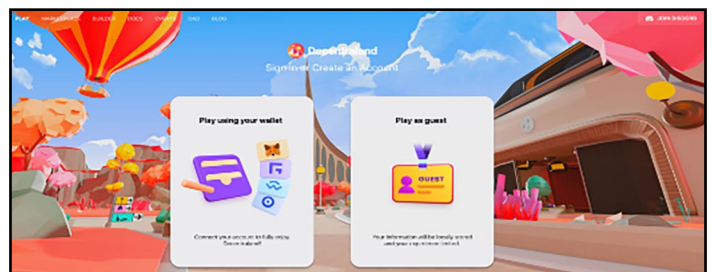
Travis Scott’s Metaverse performance on the Fortnite Platform. 12.3 million players joined him.



SNAP Augmented Reality Glasses (Snap, Inc. 2022) and Google Glass Live Video Stream Glasses (Google 2022).

ing in a shared space as if you are really there, or virtual games like Decentraland where users buy virtual real estate to build their virtual kingdoms (Decentraland 2022).

The Metaverse – Decentraland

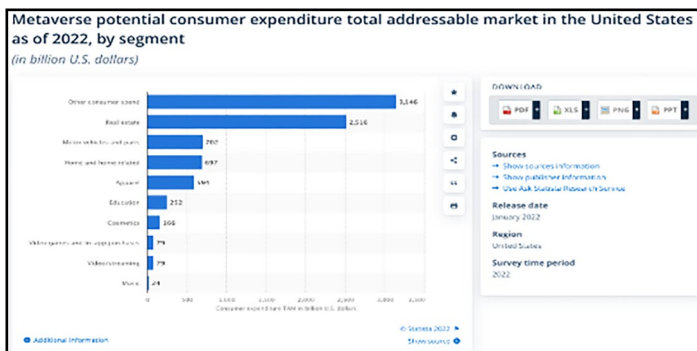


A screenshot of the get started page on Decentraland (Decentraland 2022).

Metaverse users access these lands through their computer or through virtual reality goggles like Oculus Quest 2.0 (Check out these top brands) (Denishman 2022). The [Decentraland](#) dApp users must buy MANA (Decentraland tokens on the Ethereum blockchain) to purchase virtual real estate within the game (Shahid, Decentraland (MANA) Coin: Overview 2022). The token has exact coordinates in

the virtual world to represent its location in the Metaverse. Players can also earn MANA in the game and use it to create or purchase NFTs, vote on the governance of the “land”, and buy collectibles for their homes. Think of it like Sims or [SecondLife](#) on steroids (Robin 2022).

Microsoft and Meta, along with [Nvidia](#), [Unity](#), [Roblox](#), and [Snap](#) are building these virtual worlds for us to live and play in with our friends (Ravenscraft 2022). These virtual real estate purchases are big business with NFT land sales over \$100 million at the close of 2021 (Bizouati-Kennedy 2021). The Metaverse market in the United States is on track to earn \$8.3 trillion (Alsop 2022).



(Alsop 2022).

Creator Attribution – Creative Passport

The Problem with Clearing Intellectual Property Rights in Web 1.0

Those of you working in the music licensing space since the 90s know how difficult it was to license a cover song, a sample, or a sync license before the copyright office came online. Yep, I was an intern at Island Records Miami in 1994 in the A&R department and cleared sample licenses. We had to listen to tracks and look at liner notes from previous records to figure out who owned a sample and who was the publisher of that composition. If we couldn't find them, we called the copyright office to have them look up the copyright owner and contact them on our behalf. I did this one time when we were trying to license a 1969 live reel-to-reel recording of a Fleetwood Mac concert we found in someone's closet. Long story short, one of the songwriters was living in an ashram in Nepal and had turned over all of his income to the organization, so the copyright office had to call to get their permission for us to create and distribute his song on the album.

We sent documents for the original signature by mail, and eventually the law allowed for fax signatures. That. Took. Months. If you worked on a television production, you had to send in cue sheets to the performing rights organizations by mail or fax. The same information was retyped into the PRO's database by another person (aka intern) who might have spelled the composer's name with one “T” or two.

Anyway, you would often end up with multiple writer and publisher accounts (just try searching Carole King in [BMI](#) and you'll notice there are accounts for Carole King, Carol King, and Carol King Goffin) (Broadcast Music Incorporated 2022). Songs not credited to the correct composer or publisher meant they didn't get paid their backend performance income when their song played on that network TV show. This, my friends, was licensing 1.0.

Licensing on the Web 2.0

When the copyright office came online in the late 90s we began to research ownership of songs and recordings digitally—but of course, not everything was there. They didn't finish digitizing pre-1978 copyrights until 2014! (U.S. Copyright Office 2022). I know what you are thinking... the internet didn't always exist? Yeah, no. Later in the mid 2000s, websites for the performing rights organizations like [ASCAP](#) gave licensing professionals the ability to search the owners of compositions, and finally in the mid 2010s curated databases like [Discogs](#) helped us find owners of recordings, while [Whosampled](#) helped us find owners of recordings that were sampled in popular songs (ASCAP 2022) (Discogs 2022) (Whosampled 2022). Still, television shows could fax, email, and eventually use [Cue Chronicle](#) websites that could send the data electronically in a batch to the PRO's (Cirilli 2019) Still there were problems. The television studio computer databases were set up differently and had different naming conventions than the PRO databases so the information didn't transfer correctly. Staff (e.g., interns) had to go back in and either key in the data or fix the “dirty” data that entered the database in the wrong category.

Don't even get me started on trying to transfer info from a U.S. television show to a foreign PRO in a different language. In the U.S. we call them “Publishers” but in France they call them “Editeurs.” Yes, when you imported the file from France, you had to link the two together and point one set of data to flow into each of the categories in your database (by hand of course for each batch of data) but again, humans, being humans, made lots of mistakes. I once had twenty-five gospel songs attributed to my account in ASCAP and only noticed it when I went online to check my latest registration of my *one* song. LOL, I noticed all of these songs registered to Andrea Johnson, but I hadn't written any of them. Several phone calls later, I am no longer a wealthy gospel songwriter from Nashville, but the right person is. Whew! Licensing 2.0 was easier but still required a lot of paperwork.

Blockchain and Creator Attribution 3.0

Enter the effervescent and incredibly entrepreneurial Imogen Heap, who created the [Creative Passport](#), which in her words is “a Verified Digital ID for MUSIC MAKERS, where they can ACCESS, UPDATE AND MANAGE infor-

mation about themselves and their works, and share it with others (Heap 2021).



Imogen Heap wants to create a “fair trade” music industry (Kuo 2016).

Heap has innovated a way for creators to “sign” their work as soon as it is created so that it can be licensed, tracked, and compensated on the blockchain without an intermediary. Watch out record labels, we don’t *need you* to distribute and monetize our work and, oh by the way, we are keeping all of the profits and making micropayments to everyone on our team who participated in the creation of the work. Yassss!

Imagine creating your music, adding the metadata identifying you as the owner of the recording and composition and that information would be carried along the blockchain whenever your work is placed in film, TV, ads or anywhere. You would be paid immediately because the transfer of your content on the blockchain would identify you as the rights-holder. No more hunting down publishers on the PROs or looking for owners on copyright.gov, Songfile, or the MLC. In addition, the creative passport unifies your profile, and can send your ownership data to your music distributor, PRO, manager, and team members so they always have up-to-date payment and contributor data.

She Created Three Components of Her Creative Passport

Music Makers

- Verified identity connected to your work with IPI numbers from your PRO
- Find collaborators on the platform nearby to write together

Artist Representatives (Label, Collection Society, Distributor, Publisher)

- DDEX standardization between all representatives
- Increased accuracy
- Less paperwork

- Reduced administrative costs

Music Services (Streaming Services like Spotify and Pandora)

- API for single signing (software that integrates platforms)
- Know Your Customer (KYC) compliance
- Clients can visualize current streaming numbers on your site

As she was building this, she worked with DDEX, “a standards setting organization focused on the creation of digital value chain standards to make the exchange of data and information across the music industry more efficient,” to insure that the metadata she collected about works used their naming protocols so it could be used worldwide (DDEX 2022).

What is DDEX?

DDEX created a standardized format for metadata to be exchanged between music industry partners like labels to distributors. Their format is free for all companies to implement in their businesses. Think of it as coming up with a naming convention for each piece of data that you are tracking. For instance, lyricist, composer, and publisher. This standard naming convention is used by all parties across the music industry, so that everyone’s databases import and export the information using the same categories.

They did this to reduce costs and human error in the transfer of this data between partners when music sales and payments are batched through royalty systems on streaming platforms for example. “Standardizing and automating these processes on Web 2.0 and now through blockchain on Web 3.0 will allow creators to receive higher payments for *all* of their work and receive attribution for that work through transparent decentralized systems” (DDEX 2022).

So there you have it! New technology to expand your mind and your pocketbook all while holding on to your rights as a creator, so *you* can monetize your art! Revolutionary! I hope that in turning the tech talk into layperson’s terms it has made this new Web 3.0 world accessible to you and your students. I’m happy to have done the heavy lifting, reading, and translating the scientific “babble” so your head didn’t explode trying to understand SHA256. I know, I know, we’ll revisit the “deep tech” in the next installment. Now, I encourage you try to mint a token, or an NFT, or hey, hire an engineer and an attorney to draft your first smart contract. Anything is possible in the Metaverse and now you have the knowledge to change your virtual reality!

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On campus, Ani is faculty advisor to Berklee’s Music Business Club and is an Equity Partner and a member of the Female Faculty Alliance which advocates for social justice issues on and off campus. She serves as faculty support to the student teams for the development of Berklee’s music licensing platform, Raidar, in conjunction with George Howard and teaches the Raidar Blockchain Practicum. Built *by* students *for* students, it hosts music from Berklee students, alumni, and faculty and allows them to license it for placement in films, ads, video games, and other media. Her music supervision company MonoMyth Media hires Berklee interns as music concierges, to pitch and place music from the Raidar catalog in local productions.



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