



9-15-2021

## Through the Looking Glass: Non-Fungible Tokens & Libraries

Peter Fernandez

*University of Tennessee - Knoxville*, pfernand@utk.edu

Follow this and additional works at: [https://trace.tennessee.edu/utk\\_libfac](https://trace.tennessee.edu/utk_libfac)



Part of the [Library and Information Science Commons](#)

---

### Recommended Citation

Fernandez, Peter, "Through the Looking Glass: Non-Fungible Tokens & Libraries" (2021). *UT Libraries Faculty: Other Publications and Presentations*.  
[https://trace.tennessee.edu/utk\\_libfac/11](https://trace.tennessee.edu/utk_libfac/11)

This Article is brought to you for free and open access by the University Libraries at TRACE: Tennessee Research and Creative Exchange. It has been accepted for inclusion in UT Libraries Faculty: Other Publications and Presentations by an authorized administrator of TRACE: Tennessee Research and Creative Exchange. For more information, please contact [trace@utk.edu](mailto:trace@utk.edu).

**Non-Fungible Tokens & Libraries**

Journal:	<i>Library Hi Tech News</i>
Manuscript ID	LHTN-08-2021-0048
Manuscript Type:	Through the Looking Glass
Date Submitted by the Author:	11-Aug-2021
Complete List of Authors:	Fernandez, Peter; University of Tennessee,
Keywords:	Library services, Libraries, Internet, Computer Software, Education, Technology

SCHOLARONE™  
Manuscripts

## NFTs

Non-Fungible Tokens (NFTs) are a rapidly emerging technology that sit at the intersection of cryptocurrency, digital ownership, and preservation. These trendlines are of particular importance to libraries, which often work collaboratively with their communities to share and preserve intellectual property. This column will define what a NFT is, explore the relevant trends impacting its development, and examine how it intersects with the traditional roles of the library.

### What is a NFT? Part I: Non-fungible

One explanation of NFTs is fairly straightforward: they are digital objects usually built off existing properties that are designed to be non-fungible. That is, NFTs can be given or sold to another person like an original copy of a painting. Each NFT is a unique digital object that cannot be replaced by another. The internet is a technology that dramatically reduces the barrier to mass distribution. This has resulted in digital objects that are easily copied and shared, reaching a massive potential audience. It also has resulted in digital objects that are often interchangeable. Even cryptocurrencies, which we will discuss later, is fungible in the sense that they have obvious value. One bitcoin can be exchanged for another bitcoin, and each will be identical to each other. Because many people have created digital objects that they would like to be able to sell it to a single individual rather than monetizing its distribution, this creates a new opportunity. With the advent of blockchain technology, it has become technically plausible to create digital objects that are non-fungible, resulting in NFTs.

To really understand NFTs, it can be helpful to examine a few specific examples. The 2007 viral video "Charlie bit my finger" was sold as a NFT for \$760,000, funding the brothers' college aspirations. As part of the sale, the video will be removed from YouTube. The first tweet ever sent by Twitter's CEO, Jack Dorsey, recently sold for \$2.9 million (Locke, 2021). In this case, the tweet will remain on Twitter for everyone to view. A collage of digital art titled "Everydays - the First 5,000 Days" was auctioned off by the prestigious auction house, Christie's, for \$69 million. The artist will retain the copyright to the images that make up the collage, which are available on their website, but the new owner does have the right to display the collage. The Fox television network is even developing a new show being promoted as the first show "curated on the blockchain" alongside a new company that promises to connect advertisers "directly with fans and enthusiasts through NFTs" (Hibberd & Hibberd, 2021).

As these examples demonstrate, whoever purchases a NFT obtains ownership of something that is non-transferable. That is, they own the NFT, and they can transfer that NFT to someone else. Along with that purchase, the seller may choose to include any number of other rights. For example, they could sell the copyright, but that is not the NFT. On the other hand, they might agree to take down the original digital object. What additional intellectual property rights are to be the expected norms of NFTs are still being determined.

### What is an NFT? Part II: Tokens and Trust

The "token" part of non-fungible token is certified and hosted on blockchain ledger and consists as a unique digital token. If the creator of the token chose, they could make as many tokens as they wanted, modeling NFTs after limited edition collectibles, but instead, these creators usually choose to artificially manufacture just one token and connect it to another digital object with more prominence. This connection is done using blockchain technology. Blockchain technology was invented in 2009 by an anonymous person (or people) in order to facilitate the cryptocurrency, Bitcoin. In 2011, the technology

1  
2  
3 was turned over to its community, and its creator(s) disappeared. Bitcoin is designed to serve as  
4 decentralized currency, where no single entity or government controls it. It is maintained through peer-  
5 to-peer networks rather than on a central computer (Jaffe, 2018).  
6

7  
8 Cryptocurrencies are a fascinating technology, which have the potential for massive technological,  
9 ecological, and societal disruption. They already have made some people very wealthy, even as many  
10 traditional economists remain skeptical of it. For the purposes of understanding NFTs, cryptocurrencies  
11 operate as a blockchain platform, enabling the creation of digital objects that theoretically will be  
12 maintained without a central hub or institution. Importantly, maintains a record of ownership in a way  
13 that has captured the imagination of users around the world. Because of the social capital they enjoy,  
14 users are confident that if Google goes out of business or shuts down YouTube, the NFT for “Charlie bit  
15 my finger” will remain hosted on a trusted peer-to-peer network. With some cryptocurrencies, as long  
16 as the cryptocurrency is hosted, it will still be viable.  
17

18  
19 Many academics have highlighted that the true value cryptocurrencies create may not be as currencies,  
20 but rather as sources of trust. In this context, it is worth recalling that they were first promulgated in the  
21 aftermath of a global financial crisis. This was a time when trust in institutions, like banks and  
22 governments, was at an understandable low ebb. While the average consumer/investor in blockchain  
23 products is unlikely to be able to evaluate the viability of the technology that powers cryptocurrencies,  
24 they often place their confidence in concepts like “peer-to-peer” and “algorithms”. This is bolstered by  
25 the number of prominent figures who have become rich through speculative investing in  
26 cryptocurrencies. These figures have gone on record praising the technology. The idea of moving away  
27 from currencies dominated by banks and being able to interact directly with peers fits within an  
28 appealing worldview and serves to generate a sense of trust that is critical for any economic activity  
29 (Baldwin, 2018; De Filippi et al., 2020).  
30  
31

### 32 **NFTs & Library Activities**

33

34  
35 NFTs are a distinctly odd proposition by any conventional understanding of property. In essence, what is  
36 being sold is a digital “token”. The token is maintained on a novel peer-to-peer network. The token  
37 claims to correspond to ownership of the digital object it represents. Other properties enforced by  
38 institutions like the government, such as copyright or display rights, may come along with the sale, but  
39 these properties are not the NFT. The connection between the digital object and the NFT is largely ill-  
40 defined except as a new socially created concept, which depends on trust between everyone involved.  
41 Instead, inherent trust in cryptocurrencies, the reputation of the seller, and sometimes the reputation of  
42 the auction house that facilitates the sale help provide that sense of trust.  
43

44  
45 Viewing NFTs through the lens of some traditional library activities can help shed light on what they are.  
46 One thing libraries often do is purchase print books to share with their community. The intellectual  
47 property laws that allow this are relatively straightforward. The books are relatively interchangeable,  
48 since one copy of a book is usually just as valuable as another. Having obtained ownership, the library is  
49 able to distribute the books with relative freedom. Libraries might purchase NFTs, but it would not make  
50 much sense to do so, since they would then be owners of a digital object that cannot be easily shared in  
51 most cases.  
52

53  
54 Another relevant thing that libraries often do is purchase access to digital materials on behalf of their  
55 communities. Here the intellectual property rights are usually negotiated by contract. This is similar to  
56 what happens with some NFT sales, where various rights accompany the sale. Since most digitally native  
57  
58  
59

1  
2  
3 objects have very low barriers to distribution, libraries also use software to enforce artificial scarcity  
4 through digital rights management (DRM). Blockchain provides its own DRM for the NFT, which anyone  
5 with the proper software can view. In many cases, the digital object the NFT “represents” is actually still  
6 freely accessible on its native platform. When rights are transferred, that transfer depends on a separate  
7 contract that is enforced through traditional laws.  
8

9  
10 If NFTs continue to grow in popularity and it becomes commonplace to attach intellectual property  
11 rights to the sale, one can imagine libraries purchasing the NFT in order to gain the connected property  
12 rights to digital objects similar to how special collections often operate. Depending on the library’s  
13 mission, the library may choose to share the digital media freely and place it in the public domain. Even  
14 then, the NFT would not likely be the goal of the library’s purchase, but rather the legal permissions that  
15 accompany it.  
16

17  
18 Increasingly, libraries are also producers of digital materials. A library could easily create an NFT of one  
19 of these materials. If the underlying digital material had some value to the larger community, the library  
20 could sell its NFT for a profit. But most libraries are not involved in directly creating intellectual property  
21 as a primary means of funding their organization. This might change with NFTs, but beyond a general  
22 popularity with their communities, it is unclear what particular skillset libraries would bring to bear in  
23 this market.  
24

25  
26 All of this highlights that the creation of NFTs is perhaps best understood as filling an economic and  
27 social need. People who own digital objects that otherwise have wide distribution want to be able to  
28 “sell” them. Other people want to be able to “own” them. According to the conventional models of  
29 “ownership” that the libraries and other similar institutions operate within, this does not quite make  
30 sense, but blockchain technology has created a new model of trust that allows for new social  
31 conventions.  
32

### 33 **Preservation**

34  
35 One threat to the viability of NFTs is the fact that they can break easily and might disappear without  
36 proper maintenance. These are preservation problems that libraries have relevant expertise with which  
37 to help. While libraries have been quite active in preserving other forms of more fungible digital  
38 materials, the motivation and model for libraries to preserve NFTs remains unclear. More narrowly,  
39 communities that produce valuable NFTs and have an existing relationship with libraries could create  
40 opportunities for partnership. Libraries often have the experience and reputation to provide long-term  
41 assurances that a NFT will not disappear.  
42  
43

44  
45 This is meaningful because NFTs do require ongoing maintenance for their continued existence. The  
46 reason so many computers continue to host peer-to-peer blockchain technology is because they are also  
47 hosting cryptocurrency that has proven to be a lucrative investment property. As an investment though,  
48 cryptocurrency is relatively new and still very volatile, and it has not yet become widely accepted as a  
49 currency on the retail market. It is easy to imagine scenarios where, due to government regulation or a  
50 fickle market, any particular currency rapidly falls out of favor and is no longer maintained. This is  
51 exacerbated by the tremendous environmental costs of this technology. New bitcoins are created by  
52 having computers solve complicated problems. This creates an ecosystem where the entire network is  
53 using a tremendous amount of electricity in order to create additional currency, a serious problem for a  
54 world that is also searching for ways to minimize climate change (Calma, 2021).  
55  
56  
57  
58  
59

1  
2  
3 What is less intuitive is that related technologies also have to be maintained for NFTs to function. NFTs  
4 hosted on the blockchain demonstrate the ownership of a unique digital asset, but they hold very little  
5 information about what that actual asset is. Instead they rely on other technologies to point to more  
6 information about the object and who owns it. Because URLs can easily change hands, be redirected, or  
7 be otherwise compromised, most NFTs use an InterPlanetary File System, which stores the file with  
8 additional identifying information on multiple computers.  
9

10  
11 Yet many NFT files have been found that will not load (Kastrenakes, 2021). They have been restored, but  
12 unlike the blockchain that hosts the NFT, the system relies on a relatively small number of computers  
13 that have to be maintained, a precarious position for a new technology. For headline generating NFTs  
14 worth millions of dollars, this may not be a concern, but if the technology expands and lasts for decades,  
15 it begins to generate a host of issues.  
16

## 17 **Conclusion**

18  
19  
20 NFTs represent a new and growing technology that intersections with many of the same concepts that  
21 are core to librarianship. Libraries are community institutions that engender widespread trust, while  
22 NFTs are built atop cryptocurrency that seeks to enable anonymous peer-to-peer interactions. Libraries  
23 specialize in preservation and dissemination of materials that were originally interchangeable, while  
24 NFTs are digital objects that are limited in quantity. The argument here is not that this is a list of  
25 opposites but rather that there are potential roles for libraries in helping to preserve NFTs. Libraries  
26 have already embraced global communities in new and innovative ways, and if these trends continue,  
27 NFTs will likely continue as well. Rather the trends that NFTs represent are vital to understanding the  
28 culture and technology that the internet has unleashed. For libraries to continue to evolve, they must  
29 continue to engage with these trends wherever they lead.  
30  
31

32  
33 Baldwin, J. (2018). In digital we trust: Bitcoin discourse, digital currencies, and decentralized network  
34

35 fetishism. *Palgrave Communications*, 4(1), 1–10. <https://doi.org/10.1057/s41599-018-0065-0>

36  
37 Calma, J. (2021, March 15). *The climate controversy swirling around NFTs*. The Verge.

38 <https://www.theverge.com/2021/3/15/22328203/nft-cryptoart-ethereum-blockchain-climate->

39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60  
change

De Filippi, P., Mannan, M., & Reijers, W. (2020). Blockchain as a confidence machine: The problem of

trust & challenges of governance. *Technology in Society*, 62, 101284.

<https://doi.org/10.1016/j.techsoc.2020.101284>

Hibberd, J., & Hibberd, J. (2021, May 17). Dan Harmon Making First Blockchain Animated Series as Fox

Embraces Crypto. *The Hollywood Reporter*. <https://www.hollywoodreporter.com/tv/tv->

[news/dan-harmon-blockchain-nft-crypto-series-fox-1234954403/](https://www.hollywoodreporter.com/tv/tv-news/dan-harmon-blockchain-nft-crypto-series-fox-1234954403/)

1  
2  
3 Jaffe, J. (2018, February 12). Bitcoin: The newcomer's guide to cryptocurrency. *CNET*.

4  
5 <https://www.cnet.com/how-to/what-is-bitcoin/>

6  
7  
8 Kastrenakes, J. (2021, March 25). *Your million-dollar NFT can break tomorrow if you're not careful*. The

9  
10 Verge. [https://www.theverge.com/2021/3/25/22349242/nft-metadata-explained-art-crypto-](https://www.theverge.com/2021/3/25/22349242/nft-metadata-explained-art-crypto-urls-links-ipfs)  
11  
12 [urls-links-ipfs](https://www.theverge.com/2021/3/25/22349242/nft-metadata-explained-art-crypto-urls-links-ipfs)

13  
14 Locke, T. (2021, March 22). *Jack Dorsey sells his first tweet ever as an NFT for over \$2.9 million*. CNBC.

15  
16 [https://www.cnbc.com/2021/03/22/jack-dorsey-sells-his-first-tweet-ever-as-an-nft-for-over-](https://www.cnbc.com/2021/03/22/jack-dorsey-sells-his-first-tweet-ever-as-an-nft-for-over-2point9-million.html)  
17  
18 [2point9-million.html](https://www.cnbc.com/2021/03/22/jack-dorsey-sells-his-first-tweet-ever-as-an-nft-for-over-2point9-million.html)