NFT EXPOSURE: EXPLORING LEGAL RISKS IN THE NFT MARKET

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INTRODUCTION

Imagine that a man named Ted creates a non-fungible token (NFT) of the first instant message ever transmitted on the web portal, America Online (AOL). Ted creates the NFT and then offers to sell it to you for $100. You read Jack Dorsey, the founder of Twitter, sold his first tweet at auction for $2.9 million, and Tim Berners-Lee, the internet pioneer, sold his web source code for $5.4 million a few months later in 2021.[2] Given these prices for comparable digital artifacts, Ted's offer seems like a good value but you might have questions. For example, does it matter whether the Ted in this scenario is the founder of AOL, Ted Leonsis, and the author of the tokenized message?[3] Are you sure Ted has the right to tokenize the message; and what rights are you buying from Ted? Can the owner of the NFT prevent it from appearing in scholarly articles, as it does here, below? *Hint: probably not:*

> *Don't be scared … it is me. Love you and miss you.[4]*

What if someone creates a duplicate NFT of the same instant message? Or even more nuanced, what if Ted creates a subsequent NFT of the same message using a different Ethereum standard (e.g., the popular standard ERC-721, or ERC-875, or ERC-1155), or a different blockchain altogether (e.g., TRON, using the TRC-721 standard)?[5]

Over $5 billion (USD) were exchanged for NFTs just in the third quarter of 2021, understandably leaving courts, legislators, and legal practitioners scurrying for answers to these questions, while many struggle to conceptualize NFTs on the

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[2] Elizabeth Howcroft, *World Wide Web source code NFT sells for $5.4 million at Sotheby's*, REUTERS (Jul. 1, 2021, 7:47 AM), https://www.reuters.com/technology/world-wide-web-source-code-nft-sells-54-million-sothebys-2021-06-30/.

[3] Alyson Shontell, *The First Ever Email, the First Tweet, and 10 Other Famous Internet Firsts*, YAHOO! FINANCE (Apr. 23, 2013), https://finance.yahoo.com/news/the-first-ever-email--the-first-tweet--and-12-other-famous-internet-firsts-181209886.html.

[4] *Id.*

[5] Ethereum and Tron are both examples of open-source blockchain networks, discussed later in this paper.

basest existential terms.[6] This paper offers a legal analysis of NFTs with two goals: first, to provide a foundational understanding of NFTs from both a technical and legal perspective; and second, to use that foundation to contrast different strategies legal practitioners may leverage to mitigate exposure to legal risk.

This paper continues in three sections. Part I technically introduces blockchain to explain its libertarian origins and ontological conflict with a centralized legal system. Part II distinguishes NFTs from other blockchain technologies, summarizes the legal rights and limitations of NFT ownership, and explains the valuations of NFTs in the current market. Part III summarizes current legislation and caselaw relating to NFTs and contrasts the exposure to legal risk with the benefits of blockchain from two viewpoints: (1) the crypto-speculator; and (2) the crypto-anarchist—the decentralist or libertarian blockchain purist interested in escaping central governance.

PART I – NFTs' ORIGINS: THE BLOCKCHAIN

A. BLOCKCHAIN'S APPEAL FROM TWO PERSPECTIVES: ANARCHISTS & SPECULATORS

NFTs are derivatives of blockchain technology.[7] Satoshi Nakamoto is credited with developing the first blockchain database, *Bitcoin*, in 2008.[8] In the abstract, Bitcoin is just another type of digital currency, comparable to a gift card from Starbucks, which stores digital information representing value. The difference is that the gift card is governed by a central authority, the Starbucks corporation, while Bitcoin facilitates payments without a central authority or *trust mechanism*.[9] In this way, blockchain is rooted in decentralization: the transfer of control from a central authority offering a trust mechanism, to several dispersed parties.

Adversarial parties, like buyers and sellers in a market, require trust mechanisms to facilitate trade, and offer relative assurance a buyer will receive a good or service and a seller will receive payment.[10] Trust mechanisms include banks that offer

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[6] Jamie Redman, *Q3 NFT Report Shows Non-Fungible Token Markets Are in Phase of Dynamic, Unstoppable Growth,* BITCOIN (Nov. 6, 2021), https://news.bitcoin.com/q3-nft-report-shows-non-fungible-token-markets-are-in-phase-of-dynamic-unstoppable-growth/.

[7] *See* Melissa Wingard, *NFTs – the vapourware of Blockchain technology*, POF BLOG (Apr. 30, 2021), https://www.pof.com.au/nfts-the-vapourware-of-blockchain-technology/#page=1.

[8] L.S., *Who is Satoshi Nakamoto?*, ECONOMIST (Nov. 2, 2015), https://www.economist.com/the-economist-explains/2015/11/02/who-is-satoshi-nakamoto.

[9] *See* Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System*, BITCOIN (2009), https://bitcoin.org/bitcoin.pdf.

[10] *Id.*

credit and manage debt, courts that protect intellectual and real property, and credit card companies that facilitate payments. These centralized authorities facilitate trade and offer recourse in the event of mistake or fraud, but they also make transactions more expensive—by adding to the bottom line with costs like banking or legal fees–and also pose risks as single points of failure.[11] The *Too Big to Fail* mantra that arose from the 2007-2008 financial crisis highlights the risk from relying on central authorities entrenched in our global financial system: if all our eggs are in one basket, what happens if the basket breaks?

Blockchain was designed to operate outside of central trust mechanisms, offering freedom from central governance in support of a philosophy that has come to be known as *crypto-anarchism*.[12] Analyzing how NFTs fit within a centralized legal system is something of a paradox for the crypto-anarchist, whose notion of legal risk may be limited to maintaining freedom of speech, freedom of trade, and anonymity on the Internet.[13] In contrast, the soaring values of certain cryptocurrencies and NFTs has also created *crypto-speculators.* For crypto-speculators, legal risk mitigation means protecting the value of their assets and understanding (and exploiting) any legal rights that are included with such ownership. This paper will analyze the legal risk of NFTs and qualify tradeoffs that may appeal to different market participants using these two viewpoints, the anarchist and speculator, which can sometimes be in opposition with one another.

B. BLOCKCHAIN IS A DISTRIBUTED LEDGER THAT RELIES ON CONSENSUS

Blockchain begins with the concept of a *distributed ledger*.[14] A ledger is a collection of transactions of a certain type, and a blockchain is purposefully immutable in the sense transactions may be added to the ledger but never removed.[15] Rather than tasking a single system with storing the ledger of a blockchain, it is distributed and stored redundantly on the systems of each participant within a network.[16] Each system on the network is called a *node*, and each node works independently but in agreement with other nodes on the network to broadcast every transaction and keep ledgers across the network updated.[17] Transactions are also timestamped to ensure integrity of the distributed ledger and prevent what is known as the *double spend*

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[11] *See id.* at 1.

[12] *See* Timothy C. May, *The Crypto Anarchist Manifesto*, ACTIVISM (Nov. 22, 1992), https://www.activism.net/cypherpunk/crypto-anarchy.html.

[13] *See Id.*

[14] Nakamoto, *supra* note 9.

[15] *Id.*

[16] *Id.* at 3.

[17] *See id.*

problem.[18] Satoshi Nakamoto's solution to the double spend problem in a decentralized environment was to validate transactions through a protocol based on *consensus*, and because this paper is intended for legal scholars and professionals, some analogies and hypotheticals may help clarify these concepts.[19]

Consider Starbucks *Rewards*: the coffee company's program allows customers to preload money and have it debited after each Starbucks purchase.[20] Starbucks governs their *Rewards* program, but if it worked off a blockchain instead of using centralized governance, Starbucks and all its customers would each represent nodes of a distributed network. These nodes would work independently, but in agreement with each other, to track each customer's timestamped deposits and purchases made at Starbucks. So, if I deposit $5 to my blockchain-governed Starbucks *Rewards* account, Starbucks and I would both broadcast the transaction to the network. The transaction would be validated by other nodes and added to the immutable ledger. If I then purchase a $5 drink, the chain of transactions would resemble the following:

> **Transaction 1: Scott adds $5.00 to his Starbucks *Rewards* Account.**
> *Scott's Balance: $5.00 (+$5.00)*
> *Time: 9:00 a.m. on October 10, 2023.*
>
> **Transaction 2: Scott buys a drink from Starbucks for $5.00**
> *Scott's Balance: $0.00 (-$5.00)*
> *Starbuck's Balance: $1,000,005.00 (+$5.00)*
> *Time: 9:05 a.m. on October 10, 2023.*

The second transaction, like the first, is broadcast to the network for nodes to agree, based on the order of transactions, that I had $5 as of 9:00 a.m. and at 9:05 a.m. I purchased a drink. These transactions would be validated because nodes of the network failed to spot a conflict. A conflict would exist if, say, at 10:00 a.m., I tried to get tricky and buy another $5 drink without loading more money into my account. I would be presenting the network with a double spend problem by attempting to spend my $5 twice. All the nodes on the blockchain would agree that my balance is at $0 as of 9:05 a.m., so my 10:00 a.m. purchase would not agree with other ledgers on the network. The first two transactions would be validated, but my third transaction would fail for presenting a conflict: I tried to spend $5 I did not have.

The nodes in a network reach consensus when a percentage of nodes validate that the newest transaction is legitimate.[21] Validated transactions are recorded to the

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[18] *Id.* at 1-2.
[19] *Id.*
[20] STARBUCKS, https://www.starbucks.com/rewards (last visited Nov. 25, 2021).
[21] Nakamoto, *supra* note 9.

immutable ledger and form blocks of data, which together form a chain of sequenced information.[22] A blockchain can then be summarized as a distributed ledger for assets where transactions are recorded on top of one another after being validated through consensus.

C. A Digression on Consensus: Trusting the Longest Chain & Proof of Work

All open, public blockchains operate a consensus mechanism to validate transactions on a given network.[23] Perhaps the best known blockchain network is Bitcoin, which operates on a *proof-of-work* consensus mechanism.[24] The nodes on the network validate transactions through a process called *mining*, and miners need to demonstrate proof of work before their validated transactions are added to the chain.[25] When a block is added to the chain it essentially fits, or more accurately, generates the exact numerical value all nodes of the system are expecting.[26] The only way a fraudulent block of transactions could be accepted is if the entire blockchain, from the first transaction ever recorded to the one most recently added, were reworked, block by block, to incorporate the fraudulent transaction without conflict.[27] In large blockchains like Bitcoin this is nearly impossible.[28]

The actual validation process for new transactions is done automatically and takes very little time, but Bitcoin miners must solve a complex math puzzle (the SHA-256 hashing function) before a block of validated transactions can be added to the chain.[29] The complex math puzzle is an arbitrary hurdle that is both intentionally time-consuming and computationally (hence, energy) intensive, but this hurdle is essential to

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[22] *Id.*

[23] Laura M., *Proof of Work VS Proof of Stake: Which One is Better?*, BITDEGREE (last visited Nov. 26, 2021), https://www.bitdegree.org/crypto/tutorials/proof-of-work-vs-proof-of-stake.

[24] *Id.* ("The most obvious starting point is to discuss the original adopter of Proof of Work, which is the Bitcoin blockchain.").

[25] *Id.*

[26] Jake Frankenfield, *Proof of Work (POW)*, INVESTOPEDIA (Jul. 22, 2021), https://www.investopedia.com/terms/p/proof-work.asp. ("The way that users detect tampering in practice is through hashes, long strings of numbers that serve as proof of work. Put a given set of data through a hash function (bitcoin uses SHA-256), and it will only ever generate one hash. Due to the "avalanche effect," however, even a tiny change to any portion of the original data will result in a totally unrecognizable hash.").

[27] *Id.*

[28] Werner Vermaak, *Why Nobody Can Hack a Blockchain*, COINMARKETCAP (Nov. 7, 2021), https://coinmarketcap.com/alexandria/article/why-nobody-can-hack-a-blockchain. ("The longer a blockchain exists and the more new users it attracts, the less likely it is to suffer a 51% attack. . . Therefore, considering the size of established blockchains like Ethereum and Bitcoin, such a scenario is nearly impossible.").

[29] Frankenfield, *supra* note 26.

preventing fraudulent transactions.[30] Miners must solve a puzzle for each block added, and since each block must "fit" together, a bad player cannot quickly recreate a fraudulent blockchain because of the time and energy the math puzzles would require. Therefore, miners are incentivized to only add transactions that "fit" into the existing blockchain so subsequent miners will trust and continue to build onto these transactions with future blocks. In proof-of-work, the network is coded to trust the longest blockchain as the valid record of transactions, because the longest chain has the most work put into it and would be the hardest to fraudulently manipulate.[31]

D. MORE THAN PAYMENTS: APPLICATIONS & PROOF OF STAKE

Ethereum is another open, public blockchain that is used as digital currency, and it also enables various applications to be created on top of the Ethereum platform.[32] Independent Ethereum-based networks have used decentralized applications to create blockchain solutions for insurance markets, the trading of oil commodities, and to mint NFTs.[33] Ethereum also uses a proof-of-work consensus mechanism to facilitate transactions on its network, but since Ethereum, and blockchains like it, perform more transactions that do more than transfer currency from one party to another, it may use a faster, less energy-intensive consensus mechanism called *proof-of-stake*.[34]

Proof-of-stake attributes mining power to the proportion of coins held by the miner.[35] Instead of complex math puzzles, a miner is limited to mining a proportion of transactions on the network in relation to the coins a miner owns.[36] In this way, a miner with a large stake of a blockchain's coins would be disincentivized to defraud the network because an unreliable network would devalue that network's coins, thereby decreasing the value of a stakeholders share.[37] By maintaining validity through self-interest, the proof-of-stake consensus mechanism can process transactions faster and with less energy.[38] In this way, proof-of-stake eliminates some of the drawbacks of proof-of-work blockchains. At this time, the largest cryptocurrency in terms of market capitalization to use a proof-of-stake[39]

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[30] *Id.*

[31] *Id.*

[32] Victor (@vluna), *Consensus Mechanisms*, ETHEREUM (Nov. 5, 2021), https://ethereum.org/en/developers/docs/consensus-mechanisms/.

[33] *See* KRATOS, https://triterras.com/kratos (last visited Nov. 26, 2021).

[34] Laura M., *supra* note 23.

[35] *Id.*

[36] Jake Frankenfield, *Proof of Stake (POS)*, INVESTOPEDIA (Apr. 21, 2021), https://www.investopedia.com/terms/p/proof-stake-pos.asp.

[37] *Id.*

[38] *Id.*

[39] *See* CARDANO, https://www.cardano.org (last visited Nov. 25, 2021).

consensus mechanism is Cardano.[40] Ethereum is expected to transition to the proof-of-stake mechanism with Ethereum 2.0, but this transition has yet to be adopted by a majority of the network.[41]

E. DIFFERENT BLOCKCHAINS FOR DIFFERENT PURPOSES: OPEN, CLOSED, & THE PSEUDO BLOCKCHAIN

Blockchain networks are developed with different applications and priorities in mind. Just as there are different blockchain networks to store value (e.g., Bitcoin, Ethereum, Dogecoin, and over 6,000 more), there are different blockchain networks that support NFTs.[42] Ethereum and the ERC-721 standard was the first, but blockchains like FLOW, TRON, Solana, and others also support NFTs.[43] For this legal analysis, I have separated blockchains into two categories: (1) *public* blockchains, and (2) *private* blockchains.

A public blockchain is generally what one references when considering blockchain. Bitcoin and Ethereum are both examples of open, public blockchains.[44] Anyone may access these networks and transactions are made public by design.[45] Public blockchains generally provide the most overall network security for all the reasons mentioned here prior: consensus mechanisms made public and transparent to validate transactions in a trustworthy and reliable system of record are distributed and crowd-sourced for validity.[46] These blockchains are decentralized with no single authority governing transactions made across the network.[47]

Private blockchains operate similarly to public blockchains, except that access can be restricted to a subset of people approved by a central authority governing the system.[48] Consider a large corporation that tracks certain sensitive information on a ledger which cannot be shared, perhaps due to government regulation (e.g., medical data). A private blockchain

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[40] James Royal, *12 most popular types of cryptocurrency*, BANKRATE (Nov. 10, 2021), https://www.bankrate.com/investing/types-of-cryptocurrency/. ("4. Cardano (ADA).").

[41] Victor, *supra* note 32.

[42] INVESTING, https://www.investing.com/crypto/currencies (last visited Nov. 25, 2021).

[43] Ki Chong Tran, *What is ERC721 Token Standard?*, DECRYPT (Jun. 20, 2019), https://decrypt.co/resources/erc721-what-is-it-guide-ehtereum-token.

[44] Marco Schurtenberger, *Public vs. Private Blockchains: Why Public Blockchains Are the Future*, BITCOINSUISSE (Mar. 1, 2020), https://www.bitcoinsuisse.com/outlook/why-public-blockchains-are-the-future.

[45] Nakamoto, *supra* note 9.

[46] Vermaak, *supra* note 28.

[47] Nakamoto, *supra* note 9.

[48] Schurtenberger, *supra* note 44. ("This actually characterizes the type of blockchain people are typically referring to when they speak about public blockchains.").

restricts access while still adding some of the transparency of a public blockchain, albeit to a smaller subset of nodes.[49] Generally, these private blockchains will not require the same proof-of-work consensus mechanisms as public blockchains, which makes transactions more efficient but also more susceptible to fraud or abuse.[50] The lack of transparency of private blockchains may also open the door to marketing ploys, and even bring into question whether assets exist in a blockchain at all.

Without the same transparency, scale, and consensus mechanisms of a public blockchain, how do private blockchains ultimately differ from a glorified database? True, the idea of a centralized blockchain can sound oxymoronic, but the process of adding blocks of transactions to a chain, even a private chain, make fraudulent attacks more laborious, complex, and requires a level of technical expertise far greater than changing a value in a simple database.[51] Private blockchains offer this added security while still providing a central authority that can correct or revert a ledger to a previous state far more easily than one could on an open, public blockchain; this ability to correct errors may be worth the increased risk of fraud and abuse among a small and controlled subset of nodes.[52]

This brings us back to the two viewpoints as it pertains to the NFT market: the anarchist and speculator. The anarchist will have no interest in private blockchains.[53] To them, blockchains are a means of escape from central authority.[54] The speculator, however, may welcome the security of a central authority, particularly if the speculator lacks the requisite technical expertise to navigate a marketplace ripe for fraud and abuse.

PART II – NFTs: ADDING UNIQUITY TO THE BLOCKCHAIN

A. A TECHNICAL EXPLANATION OF NFTs: NON-FUNGIBILITY & SMART CONTRACTS

To be fungible is to be interchangeable. Currency is fungible because equal units of currency are interchangeable so that I need not specify *which* dollar bills I want as payment. Paintings are generally non-fungible because they are unique. Before the inception of NFTs, most tokens on a blockchain

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[49] *Id.* ("[E]very private blockchain's participants can track the status and see the information.").

[50] *Id.*

[51] *Id.*

[52] *Id.*

[53] *See* May, *supra* note 12.

[54] *Id.* ("Just as the technology of printing altered and reduced the power of medieval guilds and the social power structure, so too will cryptologic methods fundamentally alter the nature of corporations and of government interference in economic transactions.").

functioned like currency in that they were fungible: I do not care *which* Bitcoin I get, but NFTs are analogous to paintings in that NFTs can be unique.[55] They are digital tokens that contain descriptive data (i.e., metadata) providing unique information about an asset.[56] Like words on a paper, the metadata of an NFT can describe most anything: a digital piece of art, the Empire State Building, or the original manuscripts of *Harry Potter*.[57]

Currently, NFTs are predominantly minted on Ethereum, which supports *smart contracts*.[58] Smart contracts facilitate a transaction between two parties like a traditional contract, but in a way that is self-executing, eliminating the need for trust between two parties.[59] Vending machines offer a simple example of a smart contract: I put money in the machine, the machine determines that the condition for releasing a good has been met, and out comes the soda, fulfilling the contract. Smart contracts are programs, stored on the blockchain, that execute actions when predetermined conditions are met, and they have evolved to enable increasingly advanced arrangements like minting NFTs.[60] These programs, if created on an open, public blockchain like Ethereum, are still immutable, made public, and stored over the shared and distributed ledger to nodes all over the world.[61]

As noted above, transactions made on a blockchain (e.g., smart contracts, or cryptocurrency transfers from one party to another) require computational work from nodes on the network to validate them and therefore are associated with a transaction fee.[62] On the Ethereum blockchain this fee is referred to as *gas*.[63] The gas is the "fuel" that powers transactions, or the cost a party must pay for miners to perform computational work.[64] Because

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[55] Joshua Fairfield, *Tokenized: The Law of Non-Fungible Tokens and Unique Digital Property*, 3 IND. L. REV. (forthcoming May 2022) (comparing NFTs to collectibles such as sports memorabilia).

[56] William Entriken et al, *EIP-721: Non-Fungible Token Standard*, ETHEREUM.ORG (Jan. 2018), https://eips.ethereum.org/EIPS/eip-721 (explaining the metadata extension for the NFT protocol).

[57] *See id.*

[58] Ekin Genc, *Beginner's Guide to NFTs: How to Mint a Non-Fungible Token on Ethereum*, DECRYPT (Oct. 28, 2021), https://decrypt.co/resources/beginners-guide-to-nfts-how-to-mint-a-non-fungible-token-on-ethereum. ("Ethereum is the blockchain on which the majority of NFTs are built.").

[59] *See* Vitalik Buterin, *Ethereum Whitepaper*, ETHEREUM (last updated Dec. 9, 2020), https://ethereum.org/en/whitepaper/#a-next-generation-smart-contract-and-decentralized-application-platform (explaining smart contracts).

[60] *Id.*

[61] *Id.*

[62] Danny Ryan, *Calculating Costs in Ethereum Contracts,* HACKERNOON.COM (May 29, 2017), https://hackernoon.com/ether-purchase-power-df40a38c5a2f (explaining the need for transaction fees).

[63] *Id.*

[64] *Id.*

miners expect a certain return for each block of data they process, a larger transaction that takes up more space within a block will be more expensive.[65] Transferring data via the blockchain (e.g., transferring cryptocurrency) requires less gas than storing data to the blockchain, and smart contracts are generally stored to the blockchain.[66] Additionally, smart contracts are typically larger than currency transfers in terms of data size, so adding an NFT-minting smart contract to a blockchain, at least for now, can cost thousands of dollars.[67]

B. A PRACTICAL EXPLANATION OF NFTS: VALUE IN SCARCITY

NFTs are unique, which enables them to represent ownership over unique digital, physical, or financial assets.[68] NFTs are a sort of deed: a digital token that states ownership of property or legal rights.[69] While a deed can note ownership of any manner of asset, the deed does not inherently grant more rights than it specifies and the same is true for NFTs. If I buy a physical Jackson Pollack painting then I own the painting: my proverbial *bundle of sticks* allows me to move the painting, sell the painting, exclude others from access to the painting and so on. Barring any further agreement, however, the purchase of a painting does not grant any rights or control of the artist's work, nor does it prevent the artist from making exact copies.[70] Many times, an NFT will have terms and conditions specifically outlined on the third-party platform that supports NFT transactions.[71]

Like deeds, NFTs usually state ownership of another thing, rather than being the thing itself. This is obvious when recording ownership of a tangible item – the Empire State Building cannot exist on a blockchain – but it is usually true for digital artifacts as well, and one reason for this is the technical and practical limitations of blockchain networks and the transaction costs to perform transactions. The table below provides cost examples of transferring cryptocurrency and storing smart contracts and digital artifacts on the Ethereum blockchain:

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[65] *Id.*

[66] *Id.* ("[S]toring data to the blockchain is extremely expensive, but for good reason!").

[67] *Id.*

[68] Entriken, *supra* note 58.

[69] *Id.* ("A standard interface for non-fungible tokens, also known as deeds.").

[70] *See* Lynne Lewis et al, *Non-fungible tokens (NFTs) and copyright law*, BIRD & BIRD (June, 2021), https://www.twobirds.com/en/news/articles/2021/australia/non-fungible-tokens-nfts-and-copyright-law.

[71] *Id.*

Transaction Example	Possible File Size	Gas Required (Gwei/gas = 152)	Cost in Dollars (1 ETH = $3,780)
Transfer of 1 ETH	32 B	21,000 gas	$12
Storage of Smart Contract	12 kB	7,021,250 gas	$4,034
Storage of Image	5 MB	3.125B gas	$1,795,500
Storage of Feature Film (90 Minutes, 4k)	60 GB	37.5Tn gas	$21,546,000,000

The chart shows how costly storing artifacts to the blockchain may be, so while the NFT is minted on a distributed blockchain like Ethereum that does not rely on any one point of failure, the digital artifact may very well be stored somewhere off the blockchain; on a permission-based website, for example.[73]

Today, the assets NFTs are most commonly associated with are collectibles.[74] The current market for NFTs, and the high valuation of certain NFTs, are therefore analogous to the market for fine art.[75] Just as a genuine Jackson Pollack painting will have more value because it is scarce, the NFT of Jack Dorsey's first tweet can be authenticated as the unique token containing unique metadata, and digitally signed by Dorsey, making it scarce and valuable.[76] That does not preclude anyone else from making a subsequent NFT of Dorsey's tweet, just as anyone can splatter paint on a canvas to resemble a Jackson Pollack painting, but those subsequent artifacts would lack the unique qualities that make Dorsey's NFT or a genuine Pollack painting scarce. The NFT, itself, has no inherent value because the value is derived from the artifact it represents, and in a market for collectibles, that artifact's value is derived from scarcity.[77]

C. LOOKING BEYOND SCARCITY: FUTURE APPLICATIONS OF NFTS

NFTs, like other collectibles that derive their value from scarcity, lack much practical value. However, this need not be the case as NFTs become more commonplace and their application evolve. NFTs allow us to add familiar concepts from the physical world – scarcity, ownership, and uniqueness – to the digital world, by an open-source, transparent solution that may

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[72] *See* Ryan, *supra* note 62 (explaining how to calculate Ethereum gas prices based on the price of Ethereum at a given time size of a file, and whether the file is transferred or stored. Ethereum prices and possible file sizes are approximations from October 2021, and are meant for comparison purposes).

[73] Lewis, *supra* note 70.

[74] Fairfield, *supra* note 55.

[75] Lewis, *supra* note 70.

[76] *See* Fairfield, *supra* note 55.

[77] *Id.*

change how assets are exchanged and improve the overall quality of property rights.[78] Why is this important?

> A doubling in the index of the quality of property rights leads to a more than doubling in per capita incomes. In addition, private property rights also impact the 'traditional' determinants of economic growth. Thus, it seems appropriate to class private property rights with the ultimate sources of economic growth.[79]

Stronger property rights lead to more efficient markets, providing greater opportunities for buyers and sellers to conduct transactions without increasing transaction costs.[80] Adam Smith noted divisions in labor leads to increased productivity and that such divisions arise from bartering.[81] Smith argued limited opportunity for exchange discourages division of labor, hence, productivity.[82] The future of NFTs transcends mere novelty and may create opportunities for dramatic economic growth and societal well-being.

NFTs can touch real estate law by changing the way we record title to land. Trading securities may be performed on the blockchain, making transactions more efficient by eliminating the need for market makers. Proof of vaccinations could be stored on the blockchain to offer a low-cost, government agnostic mechanism to verify vaccination statuses. Voting, as it pertains to sovereign or corporate governance, could be cast using NFTs: a token representing a vote for or against something or someone. NFTs allow content creators to market their work directly to consumers, which could then extend to creating secondary markets for digital assets.[83] NFTs could also facilitate a secondary market for more things, like loyalty programs, by allowing companies to plug into an existing framework that facilitates such capabilities without the upfront setup costs and continued cost of maintenance. For an existing example, Breitling began issuing Ethereum-based NFTs to certify the authenticity of their timepieces and add traceability to their

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[78] *See* Balaji S. Srinivasan, *Why India Should Buy Bitcoin*, MEDIANAMA (Feb. 5, 2021), https://www.medianama.com/2021/02/223-india-bitcoin-balajis-srinivasan/ (explaining why blockchain enhances property rights).

[79] Bernhard Heitger, *Property Rights and their Impact on the Wealth of Nations – A Cross-Country Study*, 2 (May 2003) (Kiel Working Paper No. 1163), https://www.files.ethz.ch/isn/102957/kap1163.pdf.

[80] *See* Eugene F. Fama, *Efficient Capital Markets: A Review of Theory and Empirical Work*, 25 THE J. OF FIN. 383-417 (1970).

[81] *See* ADAM SMITH & EDWIN CANNAN, THE WEALTH OF NATIONS (Bantam Classic) (2003).

[82] *Id.*

[83] *Non-fungible tokens (NFT)*, ETHEREUM (last visited Nov. 26, 2021), https://ethereum.org/en/nft/ (providing examples of NFT applications).

secondhand market by enabling purchasers to see a watch's chain of title.[84]

NFTs are new technology, and new technologies often begin with a skeuomorphic era before entering a native era.[85] Skeuomorphism is a manner of designing digital applications that relate to the physical objects that they represent.[86] The early internet, for example, had web pages with texts and pictures closely resembling books and magazines. Today, websites integrate sound, video, and have a certain flow that does not resemble anything like physical copies of information and the internet touches our lives in ways unthinkable decades ago. It is difficult to predict the ways blockchain technology and NFTs, while still in their nascent stage, will impact how and what manner of transactions are conducted. Yet the same decentralization that makes blockchain a robust and reliable source of record necessitates the cession of control by some presently governing centralized authority. The governance of currency and property rights, to name two examples apt for blockchain incorporation, are also thought to be fundamentals of national sovereignty.[87] Will the United States readily cede control of its dominant influence on global financial markets in the name of efficiency? If not, what difference does it make whether some nebulous blockchain says I own the Empire State Building when governments with armed soldiers declare otherwise?

When decentralized solutions are to be analyzed within another centralized authority (i.e., the American legal system), an ontological conflict presents a *rubber meets the road* phenomenon. "It is a good rule of thumb that the entity with more guns wins. Here, governments generally have more guns than private parties and so the state's courts are in a position of enforcing their law over the private law."[88] This paper certainly does not aim to disqualify NFTs as practical solutions to meaningful problems, but it will argue in its final part how advancements will either fit inside current legal frameworks or exist outside of them altogether. Legal practitioners must

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[84] Ian Allison, *Breitling Goes Live with Ethereum-Based System to Put All New Watches on the Blockchain*, COINDESK (Oct. 15, 2020, 4:16 AM), https://www.coindesk.com/business/2020/10/15/breitling-goes-live-with-ethereum-based-system-to-put-all-new-watches-on-the-blockchain/.

[85] Shaunak Bhanarkar, *How we moved past Skeuomorphism*, UX PLANET (Jul. 6, 2021), https://uxplanet.org/how-we-moved-away-from-skeuomorphism-34ff223f5318.

[86] *Id.*

[87] *See* Katarzyna Ziolkowska, *Distributing authority – state sovereignty in the age of blockchain*, 35:2 INT'L REV. OF L., COMPUT. & TECH., 116, 116 (Feb. 10, 2021) ("The argument made in this article is that, regardless of the adopted approach, blockchain poses systemic challenges to the sovereignty of states.").

[88] Max Raskin, *The Law and Legality of Smart Contracts*, 1 GEO. L. TECH. REV. 305, 328 (2017).

balance the goals of clients – those concerned merely with speculation versus those concerned with autonomy from a central authority – with the benefits and risks of a truly decentralized solution under the auspice of a strong central authority.

PART III – MITIGATING THE LEGAL RISK OF NFTs

A. THE NFT MARKETPLACE

NFTs have a lifecycle that begins with identifying or creating the underlying asset, which is then minted as an NFT on the blockchain.[89] The underlying asset exists on or off the blockchain: either in the physical world or on some third-party platform (e.g., a website, server, etc.).[90] The NFT is then generally marketed on, say, a website or social media; auction houses like Christies and Sotheby's have marketed certain high value NFTs.[91] The terms and conditions of NFTs may be included in these market listings and/or coded in smart contracts on the blockchain.[92] The sale of the NFT may be either conducted on a blockchain using cryptocurrency or off the blockchain through more traditional means of payment.[93] An NFT transaction involves a buyer and seller, but there may be any number of third-parties who help facilitate transactions by creating the underlying asset, minting the NFT, marketing the NFT, processing the transaction, and/or storing the underlying asset represented by the NFT.[94]

This section will explain how many areas of risk are germane to more traditional transfers of assets unrelated to NFTs, while other risks are particular to NFTs and blockchain technology. Open, public blockchains can offer more anonymity and robust security, but private blockchains offer varying degrees of recourse should problems arise.[95] Risk mitigation strategies can be as simple as fully comprehending the terms and conditions of an NFT, or more wisely selecting the forum for an NFT transaction. This section identifies areas of legal risk and the parties most exposed to such risk at different phases of the NFT lifecycle by discussing NFTs as they pertain to securities, banking, copyright, and estate law. Finally, this section will identify some technical risks inherent to the NFT marketplace.

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[89] *See* Kyle R. Fath et al, *Your NFT Playbook*, 11 NAT'L L. REV. (Jul. 1, 2021), https://www.natlawreview.com/article/your-nft-playbook.
[90] *Id.*
[91] *Id.*
[92] *Id.*
[93] *Id.*
[94] *Id.*
[95] *See* Schurtenberger, *supra* note 44 (comparing private and public blockchains).

B. POTENTIAL LEGAL EXPOSURE & MITIGATION STRATEGIES

SECURITIES

In the United States, cryptocurrency (e.g., ETH, BTC, Dogecoin, etc.) is categorized as a commodity and governed by the U.S. Commodity Futures Trading Commission (CFTC).[96] Initial coin offerings (ICOs), however, are considered securities offerings by the Securities and Exchange Commission (SEC) and are regulated by the Securities Act of 1933,[97] among others.[98]

To date, NFTs have not been designated as a security nor a commodity by any governing body.[99] Courts have used the *Howey* test to designate transactions as investment contracts if "a person invests his money in a common enterprise and is led to expect profits solely from the efforts of the promoter or a third party."[100] The Ninth Circuit broadened *Howey* to hold expected profits need not be solely from the efforts of a third-party, but merely primarily from such efforts.[101] Therefore, any website or third-party platform promoting the sale of NFTs may be subject to SEC regulations, but one argument against NFTs falling under the purview of securities law relates to their analog to fine art.

The market for fine art is particularly analogous to NFTs as the NFT marketplace currently exists, with so many NFTs representing digital art or similar collectibles.[102] The market for fine art has not traditionally been associated with securities, despite the wealth generated from its trade, because of the aesthetic value art may possess:

> The attitude, frequently unarticulated but persistent, that art works are exchanged in a rarefied context of reverential appreciation for

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[96]*CFTC Backgrounder on Oversight of and Approach to Virtual Currency Futures Markets*, U.S. Commodity Futures Trading Commission (Jan. 4, 2018), https://www.cftc.gov/sites/default/files/idc/groups/public/%40customerprotection/documents/file/backgrounder_virtualcurrency01.pdf.

[97] *See* Sec. Act of 1933, 15 U.S.C. § 2 (1934).

[98] *See* Alon Harnoy, *Initial Coin Offerings (ICOs): SEC Regulation and Available Exemptions from Registration*, SGR LAW (last visited Nov. 26, 2021), https://www.sgrlaw.com/initial-coin-offerings-icos-sec-regulation-and-available-exemptions-from-registration/.

[99] Letter from Vincent Molinari, President, Arkonis Cap., to Hon. Vanessa Countryman, Sec'y, Sec. Exch. Comm'n (Apr. 12, 2021), https://www.sec.gov/rules/petitions/2021/petn4-771.pdf. ("The issue of when an NFT is a security is unclear.").

[100] *SEC v. W. J. Howey Co.*, 328 U.S. 293 (1946).

[101] Maureen Holm, *The Art Investment Contract: Application of Securities Law to Art Purchases*, 9 FORDHAM URB. L. J. 386, 429 (1981) (citing *SEC v. Glenn W. Turner Enters., Inc.*, 474 F.2d 476 (9th Cir. 1973)).

[102] *See* Fairfield, *supra* note 55.

their intrinsic aesthetic merit may perpetuate reluctance to regulate the art market. Yet, art is an investment property which is traded by businessmen in a brisk and economically broad-based market. Recognition that the substance of an art transaction constitutes an investment contract or other form of security should trigger familiar investor protections.[103]

This excerpt leverages the term *investment contract* from the Securities Act of 1933 to argue fine art sold for high valuations should be considered a security.[104] The counterargument used by the author for art's exclusion from securities oversight – art's aesthetic quality – may have less merit for NFTs due to an NFT's ability to be fractionalized.[105] Unlike a physical painting, an NFT can be separated into any number of fractionalized shares, leaving one to consider if 1/1000 of a digital image has the same aesthetic quality as a painting hung in one's living room. This is the argument Arkonis Capital made in an April 2021 petition to the SEC, requesting clarification on securities law as it pertains to the NFT market.[106] Purchasing one fraction of an artwork would likely fail the *Howey* test if the only reason to purchase the fractional share of art is an expectation of profit upon resale.[107] For this reason, Arkonis' petition argues NFTs may warrant SEC oversight.[108]

In May 2021, what is believed to be the first NFT lawsuit alleging securities violations was filed in the state of New York.[109] The complaint alleges Dapper Labs, the owner of the NFT platform *NBA Top Shot*, sold unregistered securities when it marketed NFTs of video clips from National Basketball Association games for sale and resale.[110] The outcome of this complaint and those likely to follow will be telling as to how securities laws impact the NFT market. If *Dapper Labs* is any indicator, regulations will primarily focus on the marketers and marketing platforms that offer and facilitate NFT sales. Whether regulations will come to govern the individuals buying NFTs remains to be seen, but such rules may come to resemble current banking and anti-money laundering laws that focus on identifying parties in a transaction.

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[103] Holm, *supra* note 101 at 428.
[104] *Id.*
[105] *See* Letter from Vincent Molinari to Vanessa Countryman, *supra* note 99.
[106] *Id.*
[107] *Id.*
[108] *Id.*
[109] *Friel v. Dapper Labs, Inc.*, No. 653134/2021, at *1-2 (N.Y. Sup. Ct. May 13, 2021).
[110] *Id.*

As mentioned, the markets for fine art and NFTs are similar in that neither can offer more than vague justifications for why certain works sell for millions of times more than others.[111] The market for fine art has long been suspected to be a means for transferring wealth outside the purview of traditional government banking regulations.[112] "The more cynical commentators may also point to the timing of the rise in popularity of NFTs, which has coincided with the mainstream art market being made subject to anti-money laundering regulations for the first time. . . ."[113] Similar to the art market, banking and anti-money laundering regulations may soon find application in the market for NFTs.

Federal banking and anti-money laundering laws in the United States are primarily sourced from the Bank Secrecy Act (BSA) and the more recent Anti-Money Laundering Act of 2020 (AMLA).[114] Since the Patriot Act of 2001 amended the BSA, financial institutions have obligations to report suspicious activities that may facilitate the laundering of money.[115] Section 6102(d) of the AMLA expanded the definition of "financial institutions" to include businesses that exchange "value that substitutes for currency or funds," considered to include cryptocurrency exchanges.[116] As is the case with securities law, NFTs have thus far remained distinct from cryptocurrencies and inapplicable to current securities regulations, but with lawsuits currently pending, banking and anti-money laundering regulations may soon come to govern the NFT market.[117]

Maintaining anonymity may be a primary objective for the crypto-anarchist. For these individuals, pursuing transactions on decentralized exchanges (i.e., DEXs) such as Uniswap or Venus, which operate on smart contracts to facilitate peer-to-peer transaction anonymously, is the best option to ensure

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[111] Holm, *supra* note 101 at 413.

[112] Ester Herlin-Karnell, *Is There More to it than the Fight Against 'Dirty Money'?*, 19 EUR. BUS. L. REV. 557, 557 (2008).

[113] Adv. P.M. Mishra, *Legal Issues Concerning Non-Fungible tokens (NFTs)*, DECCAN HERALD (Oct. 19, 2021), https://www.deccanherald.com/brandspot/pr-spot/legal-issues-concerning-non-fungible-tokens-nfts-1041980.html.

[114] Matthew Hanson et al, *the Anti-Money Laundering Act and Crypto Collide: Non-Fungible Tokens*, JDSUPRA (May 19, 2021), https://www.jdsupra.com/legalnews/the-anti-money-laundering-act-and-3117511/.

[115] *Id.*

[116] Fin. Crim. Enf't Network, Guidance on Application of FinCEN's Regulations to Certain Business Models Involving Convertible Virtual Currencies (May 9, 2019), https://www.fincen.gov/sites/default/files/2019-05/FinCEN%20Guidance%20CVC%20FINAL%20508.pdf.

[117] *See* Letter from Vincent Molinari to Vanessa Countryman, *supra* note 99.

privacy.[118] However, different exchanges have different infrastructures, so users must use caution when making transactions and be sure to understand how a particular smart contract works. For crypto-speculators, the risks of purely anonymous DEXs and the technical knowledge required to safely operate within a DEX may not be worth the added privacy. The crypto-speculator may prefer to trade in a centralized exchange like Coinbase or Gemini. These exchanges function as trusted intermediaries, and while they often charge additional fees and require parties to verify their identity, they can also offer more assurance to parties in a transaction.[119] Centralized exchanges may also help novice speculators from unintentionally violating new regulations. *Coinbase*, for example, is a highly visible publicly traded company headquartered in Wilmington, Delaware and is therefore incentivized to develop their software in a way that helps prevent customers from unknowingly breaking the law.[120]

CONTRACT LAW

NFTs often come with terms and conditions specifying the rights associated with an NFT sale.[121] The terms and conditions of the token may be stated in plain text on a third-party platform, and/or governed by a self-executory smart contract stored on the blockchain. While such terms may trigger disputes germane to any contractual arrangement, the immutable and autonomous execution of smart contracts poses novel challenges not yet governed by statute or case law. For example, consider a new type of *Battle of Forms* if terms from a third-party platform are interpreted by the buyer differently than the developer who coded the smart contract. Smart contracts can work as an efficient means of self-help in the contract world, but how such contracts will be policed and what powers courts have to remedy disputes and govern potentially anonymous agreements on the blockchain remains to be seen.[122]

The automated execution of smart contracts presents risks associated with interpretation and fraud, but may also

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[118] NDTV, *Decentralised Crypto Exchanges: Here's What You Need to Know*, NDTV (last updated Oct. 19, 2021), https://www.ndtv.com/business/what-are-decentralised-crypto-exchanges-2579017.

[119] *See* GEMINI, https://www.gemini.com/about (last visited Nov. 26, 2021) (broadly explaining the value proposition of Gemini, a centralized cryptocurrency exchange).

[120] Matthew Goldstein, *Coinbase says the S.E.C. has threatened to sue it over a plan to pay interest.,* N.Y. TIMES (last updated Sep. 17, 2021), https://www.nytimes.com/2021/09/08/business/coinbase-sec.html (offering a brief regarding comments made by Coinbase to potential legal action from the S.E.C. regarding the company's plans to offer interest to customers in possible violation of securities regulations).

[121] *See* Lewis, *supra* note 70.

[122] *See* Raskin, *supra* note 88.

challenge how a court interprets and offers remedy to smart contract disputes. When parties are known and acting in good faith, the opportunity for courts to have access to the individuals and assets in question appears more straight-forward. Known parties can bring disputes against one another in front of a court, and courts can demand a wronged party is made whole. However, cases of intentional fraud and the prevalence of blockchain schemes known as *Honeypots* presents a different type of risk.[123] Honeypots are types of blockchain traps that attempt to lure buyers into seemingly benevolent contracts with hidden terms coded in a way that may not be clear to one party.[124] When parties are anonymous and paid in cryptocurrency, which itself can be hard to trace, harmed parties may have limited options for recourse.[125]

The autonomous execution of smart contracts offers an efficient means to help ensure parties adhere to agreements, but there are risks involved and limited options for recourse in the event of disputed interpretation of agreements, fraud, or other issues like unconscionability.[126] Again, the approach for risk mitigation will depend on the goals of the individual. The crypto-anarchist may accept the risks that come with participating in a decentralized exchange because it more readily offers privacy and autonomy. The crypto-speculator may be wise to choose more centralized forums that offer clearly stated terms and conditions and ensure parties and funds are identifiable and traceable. Centralized exchanges are more likely to implement customer identification programs, which offer courts a clear path to police transactions.[127] Without such identification, however, our legal system may be practically limited to enforcing judgements, making it critically important for buyers to use caution when participating in the NFT market.

COPYRIGHT

NFTs are a type of deed that represents ownership of an asset: be it a physical asset, digital asset, or some sort of

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[123] Christof Ferreira Torres et al, *The Art of the Scam: Demystifying Honeypots in Ethereum Smart Contracts*, 2 USENIX (Aug. 14, 2019), https://www.usenix.org/conference/usenixsecurity19/presentation/ferreira.
("Instead, they try to lure their victims into traps by deploying seemingly vulnerable contracts that contain hidden traps. This new type of contracts is commonly referred to as *honeypots*.").

[124] *Id.*

[125] *Id.* at 3.

[126] *See* Raskin, *supra* note 88.

[127] Drew Hinkes, *Set it and Regret It?: Smart Contracts, Injunctions, and Fraudulent Transfers, Part I*, MEDIUM (Oct. 24, 2019) https://medium.com/@drewhinkes/set-it-and-regret-it-smart-contracts-injunctions-and-fraudulent-transfers-part-i-c475372cc7f8. ("However, in the absence of [identification] compliance, it is likely that participants in the smart contract are only identified by public key addresses, which complicates efforts to identify transferees.").

intangible right to say, intellectual property.[128] While transferring a copyright on a nonexclusive basis does not require a written agreement, the transfer of a copyright owner's exclusive rights generally requires a written agreement signed by the owner conveying such rights.[129] In the United States, recording this agreement with the Office of Public Records and Repositories is not mandatory for such rights to be conveyed, but it offers owners priority between conflicting transfers and provides constructive notice to the public.[130] Therefore, NFTs may not be the best means by which parties should convey copyright ownership, but it does not preclude NFT transfers from serving as a record of copyright conveyance. The following two examples illustrate how NFTs can be associated with works of art. The first case demonstrates how NFTs may be used to convey copyrights, while the second case offers an example of NFTs being merely associated with a particular asset without conveying any additional copyrights.

In June 2021, a New York court halted the sale of an NFT alleged to represent ownership of the debut album *Reasonable Doubt* from the musical artist, Jay-Z.[131] The NFT was being sold by Jay-Z's former business partner and record label co-founder, Damon Dash.[132] The court determined that because Dash was a shareholder in the record company, rather than the owner of the record itself, he could not sell what he did not own.[133] As of October 2021, the NFT is marketed as a "commemorative token," that comes with a promise from Dash to sell his stake in the record company, Roc-a-Fella Records, rather than the album, *Reasonable Doubt*.[134] This case illustrates the important distinction between an NFT and the terms and conditions that may accompany the purchase of the NFT. To be clear, the court did not rule that Dash could not sell an NFT conveying intellectual property rights, but rather, Dash could not sell the rights to an album he did not wholly own.[135] In this way, the NFT merely served as the deed for a sale of intellectual property, and it was that sale of intellectual property that was deemed, at least temporarily, invalidated. While this case invalidated the sale of

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[128] Entriken, *supra* note 58.

[129] U.S. Copyright Off., Copyright Basics 3 (last updated Sep. 2021), http://www.copyright.gov/circs/circ01.pdf.

[130] *Id.* at 4-5.

[131] *Roc-A-Fella Records, Inc. v. Damon Dash*, No. 1:21-cv-5411 (S.D.N.Y. Jun. 18, 2021).

[132] Blake Brittain, *Jay-Z label Roc-A-Fella blocks co-founder's 'Reasonable Doubt' NFT auction*, REUTERS (Jun. 22, 2021, 2:46 PM), https://www.reuters.com/legal/transactional/jay-z-label-roc-a-fella-blocks-co-founders-reasonable-doubt-nft-auction-2021-06-22/.

[133] *Id.*

[134] FOUNDATION, https://foundation.app/@DashNFTGallery/~/62796 (last visited Nov. 26, 2021).

[135] Brittain, *supra* note 132.

intellectual property, it did not preclude NFTs from serving as the means to convey intellectual property.

Another example illustrates how NFTs contain no intellectual property rights, but are simply associated with a piece of art. One Twitter account posted offers of NFTs to famous works of art now in the public domain.[136] Barring any stated terms or conditions associated with the NFT, the sale of such an NFT would be legal.[137] Unlike the previous case involving Jay-Z, the sale of NFTs associated with art in the public domain do not purport to convey ownership of any copyright. This latter case is analogous to someone selling a t-shirt with the Grand Canyon depicted on the front. The t-shirt is associated with the Grand Canyon, but it does not claim to bestow any rights of ownership to the landmark: owning the t-shirt does not mean one owns the Grand Canyon. NFTs can be minted to represent any asset imaginable, but an NFT does not inherently grant any rights beyond ownership of the NFT itself.

Just as NFTs can serve as contracts with terms and conditions either coded into an autonomous smart contract or stated explicitly on a third-party platform, NFTs can also be used to convey exclusive intellectual property rights from one party to another.[138] In the United States, the Office of Public Records and Repositories already offers a means for parties to record such rights. The crypto-anarchist, looking for freedom to transact outside the governance of some central authority may resist recording a copyright with a government agency. For these individuals, NFTs may suffice as vehicles to convey intellectual property, but to what extent a smart contract is recognized by law and what rights are inherent with such transactions is unclear. For example, when physical works of art are purchased, the right to publicly display such works has generally been implied and permitted.[139] But the law is unsettled as to the extent the purchaser of digital art may display such works on various websites or similar digital platforms.[140] For this reason, crypto-speculators may prefer to rely on traditional writings that specify intellectual property rights and, if the effort is justified, record

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[136] @GlobalArtMuseum, TWITTER (Mar. 17, 2021, 2:09 PM), https://twitter.com/GlobalArtMuseum/status/1372248657374834688.

[137] Fred Clark et al, *What are the legal issues concerning non-fungible tokens (NFTs)?*, ART LAW & MORE (Jul. 8, 2021) https://artlawandmore.com/2021/07/08/what-are-the-legal-issues-concerning-non-fungible-tokens-nfts/. ("While undoubtedly ethically questionable, such activity is not inherently illegal.").

[138] *Id.*

[139] *Id.*

[140] *See* Heather J. Meeker et al, *Non-Fungible tokens (NFTs): When Collecting Meets Crypto, Legal Challenges Abound*, O'MELVENY (Mar. 25, 2021), https://www.omm.com/resources/alerts-and-publications/alerts/non-fungible-tokens-when-collecting-meets-crypto-legal-challenges-abound/.

such written agreements with the Office of Public Records and Repositories.

ESTATE

In *Tokenized: The law of Non-Fungible Tokens and Unique Digital Property*, Joshua Fairfield argues that NFTs are personal property.[141] Courts define cryptocurrency (e.g., Bitcoin) as personal property, and while NFTs can be distinguished from cryptocurrency, no court has yet distinguished NFTs as anything other than property for the purposes of estate law.[142] Therefore, barring any terms and conditions associated with an NFT which may limit rights exclusively to an individual token owner, NFTs may be treated like any other asset for purposes of estate planning. With that said, the technological nature of NFTs pose practical issues in how NFTs are accessed and transferred.[143]

The primary focus for individuals wishing to incorporate NFTs into their estate plans should be to make such assets known to their representatives. As with any estate plan, preparing an inventory of assets assists with administrative duties, but particular to NFTs, offering details as to how those assets are accessed becomes particularly necessary.[144] One approach to ensuring access is to leverage multi-signature (multi-sig) wallets, which mitigate some of the access concerns associated with the private key mechanisms blockchains leverage. Digital wallets can be configured with multi-sig to enable access by more than one private key, and these private keys can either be stored on different devices owned by the same person or shared amongst multiple people. Depending on the configuration, multi-sig can offer a check on transactions performed by requiring two or more parties to approve a transaction before it is executed. In this way, multi-sig wallets help ensure assets are accessible by a trustee of an estate and can also enable a trustee to approve transactions to beneficiaries per the trustor's wishes. Multi-sig wallets can require technical knowledge, and a configuration that requires multiple signatures can make transactions more complicated and tedious. Despite these additional hurdles, courts and would-be beneficiaries are practically limited as to the extent such assets can be obtained and transferred should NFTs not be accessible. For this reason, crypto-anarchists and speculators alike wishing to pass NFTs to their heirs should ensure third-parties are aware of the asset and have means by which to access the asset.

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[141] *See* Fairfield, *supra* note 55.
[142] *United States v. Petix*, 767 Fed.Appx. 119 (2nd Cir. 2019) (No. 17-3774).
[143] Clark, *supra* note 137.
[144] *Id.*

C. TECHNICAL RISKS & MITIGATION STRATEGIES

Problems may result from negligence, fraud, or ignorance of the law, but the nuanced and technical nature of NFTs pose inherent risks that threaten the permanent loss of digital assets. A lawyer advising a client how to mitigate risk should be focused on three primary areas of technical risk that involve access, transaction errors, and maintenance of the underlying asset.

LOSS OF ACCESS

Loss of access to NFTs is a common issue relevant to digital assets. Approximately 4% of the cryptocurrency, Bitcoin, is lost every year due to user error and loss of access to digital wallets.[145] Access to NFTs work similarly to cryptocurrency, so parties must take care to ensure credentials are secure and digital wallets remain accessible. Again, multi-sig wallets are a valuable tool to add access redundancy and enable a second party to recover assets should the primary owner lose access. Centralized exchanges may be able to offer their customers help in recovering access to digital assets, but these exchanges can generally offer such recourse only because of the identification requirements they instill. Crypto-speculators may not mind having to identify themselves, viewing the loss of anonymity to be a worthwhile tradeoff for having another means to access their digital assets. Crypto-anarchists, however, may balk at identification requirements that threaten their anonymity, and view alternative routes for access as a security risk offering hackers and thieves another way at their digital assets.

MISTAKEN TRANSACTIONS

Mistaken transactions are another technical risk that NFT owners should strive to mitigate. NFTs are generally exchanged by entering an alphanumeric address: an Ethereum address, for example, can be up to 42 characters in hexadecimal format (numbers from "0"-"9" and letters from "A"-"F").[146] It is not difficult to imagine one party making a typographical error when attempting to send an NFT to another party, or another wallet of the same owner. In some circumstances, transferring digital assets to the wrong party can be irrevocable and the party that mistakenly receives an unexpected windfall may be unidentifiable and unreachable. A mistaken transaction will also be irreversible if the NFT is burned. Burning NFTs is frequently done when an NFT is either minted by mistake or a party wishes to take certain tokens out of circulation to increase the scarcity

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[145] *There Will Never Be More Than 14 Million Bitcoins,* CANE ISLAND (Apr. 16, 2020), https://static1.squarespace.com/static/5d580747908cdc0001e679 2d/t/5e98dde5558a587a09fac0cc/1587076583519/research+note+4.17.pdf.
[146] *See* Tuna Tore, *Technical Guide to Generating an Ethereum Address,* HACKERNOON (Jan. 3, 2020), https://hackernoon.com/how-to-generate-ethereum-addresses-technical-address-generation-explanation-25r3zqo.

of other tokens.[147] Many third-party platforms facilitate the burning of NFTs with a hyperlink to make the task easy to perform, but NFTs may also be burned when a party sends the token to a null address, inaccessible to any party.[148]

Again, multi-sig wallets can help mitigate the risk of mistaken transactions. Depending on its configuration, a multi-sig wallet can also offer a check on transactions performed by requiring two or more parties to approve a transaction before it is executed. In this way, should one signer make a mistake upon initiating a transaction, another party can confirm the transaction is set up correctly before it is executed. Another tool to prevent mistaken transactions is the use of off-blockchain third-party platforms. These platforms offer intuitive user-interfaces that simplify transactions and create point and click tools with clear descriptors and various confirmation screens to ensure a transaction is performed as intended.

MAINTENANCE OF THE UNDERLYING ASSET

NFTs are stored on the blockchain, and Part I of this paper explained why open, public blockchains like Ethereum are robust and secure due to their decentralized configuration. However, the underlying asset for which an NFT represents ownership is generally not stored on the blockchain. Instead, these assets – say, an image, video clip, or song – may be stored on a single private server that can be destroyed or lost at any time. Concerned parties should consider traditional data protection strategies which include redundant data backups on multiple hard drives and cloud servers, and ensuring data is encrypted and secured.[149]

CONCLUSION

NFTs may come to eliminate the need for centralized trust mechanisms to facilitate trade in an adversarial environment. Because the control of these mechanisms factors into our very notion of national sovereignty, NFTs have the potential to become revolutionary technology in the most literal sense. The crypto-anarchist sees the revolutionary potential of NFTs as a means of replacing freedom-restricting governance with transparent blockchain technology. While in their current nascent stage, however, NFTs are most often associated with Tweets and cat illustrations, and the crypto-speculator is merely

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[147] Oliver Knight, *How does token burning work and what are the advantages?*, YAHOO! (Jun. 7, 2020), https://www.yahoo.com/now/does-token-burning-advantages-100018910.html. ("To start with, token burning is a deflationary mechanism usually meant to affect the token price.").

[148] *Id.* ("To 'burn' these tokens, their signatures are sent to a black hole (or "eater") address.").

[149] *See* Juliana De Groot, *101 Data Protection Tips*, DIGITAL GUARDIAN (Jan. 25, 2021), https://digitalguardian.com/blog/101-data-protection-tips-how-keep-your-passwords-financial-personal-information-safe.

trying to make a quick buck in this space. These two viewpoints largely represent participants of the NFT market, and while their viewpoints are diametrically opposed, the risk mitigation strategies discussed in this paper have been mostly applicable to both. This is because the interests of NFT market participants are generally aligned: everyone wants to avoid criminal prosecution and keep their assets safe and accessible. Where participants' interests diverge is at the tradeoff point between autonomy and recourse.

The anarchist is focused on autonomy, while the speculator is interested in what recourse is available should something go wrong. At this early stage, the NFT market offers solutions for both. Speculators would do well to work in centralized exchanges where parties are identified and more accessible to traditional regulation. Anarchists may choose decentralized exchanges, where security and anonymity are more robust, even if recourse is limited. For the regulators' part, our legal system has thus far appeared well-equipped to handle the challenges NFTs have posed, treating them as deeds in various categories of law. However, just as the internet evolved from simple web pages and instant messages to the digital metaverse we are creating today, NFT applications will also evolve, from cat illustrations and Tweets to something more.

Since national sovereignty is largely defined by governance of our centralized trust mechanisms, if these applications come to more specifically threaten these mechanisms, the distinction between anarchists and speculators and their approach to mitigating risk in the NFT market will grow more pronounced. Even the most benevolent government regulator cannot offer recourse to the speculator without threatening the autonomy of the anarchist, but a government seeking to recapture control for its own sake would force an evolving NFT marketplace to either work within a tailored experience that more easily facilitates governance, or work outside it entirely. Where these lines are drawn will depend on what concessions the government and the market participants – the anarchists and speculators – are willing to make between autonomy and recourse. How these lines are drawn will inform legal practitioners as to the future of legal risk within the NFT market.