A BRIEF INTRODUCTION TO DIGITAL ART & BLOCKCHAIN[♦]

As the Internet Revolution continues, needs-based and user-driven solutions continually arise to empower the commons. In the art world, one such manifestation has taken form in the Digital Art Movement,[1] which seeks to create a greater opportunity for people to appreciate, own, and sell valuable art. In order to explore this legal front, the *Cardozo Arts and Entertainment Law Journal* (*AELJ*) has invited two panels of academics and practitioners at the forefront of the blockchain and digital art industries to examine unique and emerging issues in the fields. Before jumping into *AELJ*'s Symposium panel discussions, this Essay aims to provide the requisite background on blockchain and digital art in order to contextualize the discussion that will follow.

I.   A BRIEF INTRODUCTION TO BLOCKCHAIN TECHNOLOGY

In the past few years, "blockchain" has become a preeminent buzzword discussed amongst numerous legal circles. In the simplest terms, blockchain is a decentralized and easily monitored electronic ledger that has the ability to track every point of a transaction.[2] Satoshi Nakamoto (a pseudonym), the inventor of Bitcoin,[3] first proposed the use of blockchain.[4] Since Nakamoto launched Bitcoin in 2009, blockchain technology has been used to "[underpin] an array of online services that seek to use the technology to store information and run computer processes."[5] Currently, blockchains are used primarily to

---

[♦] Permission is hereby granted for noncommercial reproduction of this Essay in whole or in part for education or research purposes, including the making of multiple copies for classroom use, subject only to the condition that the names of the authors, a complete citation, and this copyright notice and grant of permission be included in all copies.

[1] *Digital Art*, ART STORY, https://www.theartstory.org/movement-digital-art.htm (last visited Mar. 17, 2019) ("In its most distilled essence, digital art encapsulates an artistic work or practice that uses any form of digital technology as part of its creation or presentation process.").

[2] *See What Is Blockchain?*, IBM, https://www.ibm.com/downloads/cas/KMAVML1D (last visited Mar. 25, 2019).

[3] Bitcoin is a payment system which uses peer-to-peer technology that operates without a central authority or banks, and the network collectively manages transactions and the issuing of bitcoins. *See* BITCOIN, https://bitcoin.org/en/ (last visited Mar. 26, 2019).

[4] *What Is Cryptocurrency: Everything You Must Need to Know!*, BLOCKGEEKS (Sept. 13, 2018), https://blockgeeks.com/guides/what-is-cryptocurrency/.

[5] PRIMAVERA DE FILIPPI & AARON WRIGHT, BLOCKCHAIN AND THE LAW: THE RULE OF CODE 3 (2018).

transfer cryptocurrencies, manage records, and build smart contracts.[6]

While some states have enacted blockchain-related laws, the laws are primarily limited to recognizing records stored on a blockchain as analogous to traditional records.[7] This means that short of the guidance provided by such laws, the development and use of blockchain is essentially unregulated in the United States.[8] Although blockchain has the ability to revolutionize the way transactions are conducted, the core qualities of blockchain briefly explored below—including its transnational, tamper-resilient, disintermediated, and pseudonymous nature—can also present unique challenges when it comes to regulating blockchains.

A. *Transnationality*

Blockchain networks are transnational because they operate across national borders and are accessible by anyone with an Internet connection.[9] This aspect of blockchain can prove to be extremely useful for fields such as the arts, where it has been proposed that blockchain be used to halt the trade of illegal antiquities.[10] Antiquities could be recorded on a blockchain, and if any object matching the recorded object becomes available for sale, that object would be rendered unmarketable, regardless of where the object or sale is located.[11] For similar reasons, blockchain has also been proposed as a more efficient method of recording and vetting title of art across the world.[12]

While the transnational nature of blockchain can be beneficial, it also presents one of the biggest issues for regulating blockchain: as blockchain networks span the globe, it may be difficult to hold developers, miners, and users accountable for failing to abide by any

---

[6] *Id.* at 2. "A smart contract is a computer code running on top of a blockchain containing a set of rules under which the parties to that smart contract agree to interact with each other. If and when the pre-defined rules are met, the agreement is automatically enforced." *Smart Contracts*, BLOCKCHAINHUB, https://blockchainhub.net/smart-contracts/ (last visited Mar. 26, 2019).

[7] Kevin Werbach, *Trust, But Verify: Why the Blockchain Needs the Law*, 33 BERKELEY TECH. L.J. 489, 525–26 (2018).

[8] *Id.* at 517.

[9] DE FILIPPI & WRIGHT, *supra* note 5, at 34; Tonya M. Evans, Cryptokitties, Cryptography, and Copyright: Non-Fungible Digital Creativity on the Blockchain 9, BYU Copyright and Trademark Symposium (Oct. 8, 2018) (unpublished manuscript) (*available at* https://copyrightsymposium.copyright.byu.edu/papers/CryptoKitties_Cryptography_and_Copyright.pdf).

[10] *See* Derek Fincham, *Can Blockchain Technology Disrupt the Trade in Illicit Antiquities?*, 14 NO. 2 ABA SCITECH LAW. 4, 5–7 (2018); *see also* Taylor Moskowitz, Note, *The Illicit Antiquities Trade as a Funding Source for Terrorism: Is Blockchain the Solution?*, 37 CARDOZO ARTS & ENT. L.J. 193 (2019).

[11] Fincham, *supra* note 10, at 7.

[12] Elhanani, *How Blockchain Changed the Art World in 2018*, FORBES (Dec. 17, 2018, 1:18 PM), https://www.forbes.com/sites/zoharelhanani/2018/12/17/how-blockchain-changed-the-art-world-in-2018/#60b1afb53074.

regulation adopted in the United States.[13] Steps have been taken by countries around the world to combat this issue, but no substantive policies have been adopted yet.[14]

B. *Consensus and Tamper-Resiliency*

For a new transaction to be added to a blockchain, a network of peers must come to a consensus and agree that the transaction is valid.[15] This structure helps ensure the blockchain is tamper-resistant, because if a party attempts to unilaterally modify the blockchain, the consensus needed to approve the change would not be achieved.[16] Further, the consensus requirement of blockchain could be particularly useful in tracking the copyrights of digital goods, where there is concern over the "proliferation of unauthorized copies of digital works";[17] digital art may be among the goods benefitted by this quality of blockchain.

An issue, though, is that four mining pools currently control over fifty percent of the Bitcoin blockchain, and two mining pools control over fifty percent of the Ethereum blockchain.[18] If the government wanted to ensure those pools would not work together to corrupt the blockchain, it would need to regulate the miners[19]—this would require a method of holding miners accountable for verifying unlawful transactions, even when the miners are unaware of the unlawful nature of the transactions.[20]

C. *Disintermediation and Pseudonymity*

The disintermediated blockchain structure allows parties to directly engage with each other rather than relying on an intermediary to confirm the transaction.[21] Blockchain protocols are predominantly written by computer programmers; therefore, no single party controls the operation or maintenance of the blockchain.[22] This allows users to

---

[13] DE FILIPPI & WRIGHT, *supra* note 5, at 35.

[14] Some steps taken include hosting a session at the March 2018 G20 Summit on global governance of digital currency, and the International Standards Organization (ISO) forming a committee to address the issues of governing blockchain. Alison Kutler & Antonio Sweet, *Blockchain's Trust Problem: Using Public Policy as a Building Block*, THE HILL (Aug. 29, 2018, 4:45 PM), https://thehill.com/blogs/congress-blog/technology/404244-blockchains-trust-problem-using-public-policy-as-a-building.

[15] DE FILIPPI & WRIGHT, *supra* note 5, at 42; Evans, *supra* note 9, at 9.

[16] DE FILIPPI & WRIGHT, *supra* note 5, at 36.

[17] Evans, *supra* note 9, at 11–13; *see, e.g.,* Jacklyn Wishnia, Note, *Blockchain Technology: The Blueprint for Rebuilding the Music Industry?*, 37 CARDOZO ARTS & ENT. L.J. 229 (discussing the benefits and potential limitations of using blockchain technology to address the rights management issue of digital musical works).

[18] DE FILIPPI & WRIGHT, *supra* note 5, at 180.

[19] *Id.*

[20] *Id.* at 181.

[21] *Id.* at 34.

[22] *Id.* at 34–35.

directly interact with each other by using digital signatures and public-private key cryptography.[23] These direct interactions are pseudonymous, because the only information that is public is one's public key, and all transactions linked to a specific public key can be traced, even if the real identity is private.[24]

Disintermediation and pseudonymity could be especially helpful to artists who want to apply for a copyright but would like to remain "masked."[25] Under current copyright law,[26] if a masked author wants to file for a copyright, she must use an intermediary, such as an agent or lawyer.[27] Having to use an intermediary to remain masked places artists "at the mercy of another's faith, competence, and goodwill."[28]

The pseudonymous nature of blockchain poses some of the biggest issues for government regulation. If blockchains were being used to facilitate illegal activity, the government would have little recourse against the programmers who developed the protocol. Potential governmental action could include mandating that developers create a backdoor that would allow the government to suspend illegal blockchains,[29] or holding developers strictly liable for any crimes that arise on their blockchain.[30] Such regulations, however, can be limited by the First Amendment rights of programmers.[31]

Blockchain has made a major impact in rethinking the way transactions can be made more efficient; however, the technology is not without its drawbacks. Blockchain technology has the potential to play a key role in the digital art realm to ensure authenticity, create scarcity, and improve artist attribution.[32] The next Section will provide a background and discussion of digital art.

II. A BRIEF INTRODUCTION TO DIGITAL ART

Digital art differentiates itself from traditional art by being "made or presented using digital technology."[33] In digital art, the initial release

---

[23] *Id.* at 36–38.
[24] Jerry Brito & Andrea Castillo, *Bitcoin: A Primer for Policymakers*, MERCATUS CTR. AT GEO. MASON U. 11–12 (2013), https://www.mercatus.org/publication/bitcoin-primer-policymakers.
[25] Tom W. Bell, *Copyrights, Privacy, and the Blockchain*, 42 OHIO N.U.L. REV. 439, 464 (2016).
[26] 17 U.S.C. § 409 (2010) (stating "[t]he application for copyright registration shall be made on a form prescribed by the Register of Copyrights and shall include -- (1) the name and address of the copyright claimant . . .").
[27] Bell, *supra* note 25, at 461.
[28] *Id.*
[29] DE FILIPPI & WRIGHT, *supra* note 5, at 181.
[30] *Id.*
[31] *Id.* at 182.
[32] Angel Deforge, *Digital Art and Photography Within the Blockchain*, MEDIUM (Oct. 5, 2018), https://medium.com/blockstreethq/digital-art-and-photography-within-the-blockchain-bb744c934260.
[33] *Digital Art*, TATE, https://www.tate.org.uk/art/art-terms/d/digital-art (last visited Mar. 26, 2019).

or display of the work by digital means is crucial. Digital art can be stored on a blockchain because it exists as a digital asset, which is found "only in lines of code in a decentralized ledger [otherwise known as a blockchain]."[34] As a digital asset, digital art can be released and traded in a digital wallet, just like a cryptocurrency.[35] A benefit of digital assets is that they can only be owned by one digital wallet at a time;[36] thus, while the redistribution risk may still be present, it is now possible to own a truly unique piece of digital art, attributable to its author, with its provenance easily verifiable to the world at large.

Some notable examples of digital art, "CryptoKitties" and "Rare Pepes," have sold for as much as $110,000 and $39,200, respectively.[37] Notably, these works are sold through what is essentially the medium of the work itself. For instance, CryptoKitties trade on the CryptoKitty platform, which is built on the Ethereum network. Similarly, Rare Pepes trade on the Rare Pepe wallet platform, which is built on the Bitcoin network.[38]

Although digital art is a positive for artist attribution, some creators may enjoy the anonymity that comes along with the widespread dissemination of their artwork.[39] Take, for example, protest art or memes criticizing candidates in upcoming elections. The artists who create those works may want to remain unknown for fear of ramifications in their personal or professional life. In such cases, blockchain technology is also useful, since it could enable the artists to profit off of their protest and political art by allowing the author to sell under a pseudonym while still personally authenticating her works.[40] The blockchain also adds value to political artwork, because once data is added to the blockchain, it is exceedingly difficult to delete.[41]

III. ART LAW'S DISRUPTION: BLOCKCHAIN AND FRICTION

Today, fragile and easily manipulated paper documentation is widely used to track provenance, or the paper trail of ownership and movements in the fine art industry.[42] These forces have led to an

---

[34] Zach Hines, *The Weird, Wild and Expensive World of Blockchain Art*, ENGADGET (Aug. 30, 2018), https://www.engadget.com/2018/08/30/cryptokitties-gods-unchained-blockchain-art/.

[35] *Id.*

[36] *Id.*

[37] Daniel Penny, PARIS REV. (Jan. 23, 2018), *How Much for That Pepe? Scenes from the First Rare Digital Art Auction*, https://www.theparisreview.org/blog/2018/01/23/much-pepe-scenes-first-rare-digital-art-auction/.

[38] *Id.*

[39] Will Ellsworth-Jones, *The Story Behind Banksy*, SMITHSONIAN (Feb. 2013), https://www.smithsonianmag.com/arts-culture/the-story-behind-banksy-4310304/.

[40] *See supra* Section I.C; Josh Petty, *Digital Art on the Blockchain*, MEDIUM: HACKERNOON (May 17, 2018), https://hackernoon.com/digital-art-on-the-blockchain-718a631c446b.

[41] Petty, *supra* note 40.

[42] Press Release, Deloitte Develops Blockchain Proof of Concept to Solve Traceability Issues in

industry plagued with fraud—one that does not automatically assign value to the artists who create the works.[43] Professor Derek Fincham has described art fraud as "a massive problem caused by a paucity of industry self-regulation."[44] Evidence of this lies in the fact that faulty art provenance so often permits dealers and collectors to ignore the history of the works they sell and purchase, enabling them to trade works of art that are acquired through illicit means.[45]

Blockchain has recently surfaced as an answer to this dilemma, in part due to its primary function as a highly secure registry. Fundamentally, blockchain is a data ledger that is constantly being verified.[46] For both physical and digital works, blockchain represents a way to document provenance. Subsequently, a number of companies have sprung up, offering a blockchain-based registry for existing works of art.[47] However, the following points should be noted: (1) such a registry would only work if it were comprehensive,[48] and (2) blockchain's rigorous verification requirements would be difficult to implement in an industry that prizes anonymity.[49] Thus, the effective

---

Art (May 13, 2016), *available at* https://www2.deloitte.com/lu/en/pages/technology/articles/blockchain-proof-concept-solve-traceability-issues-art.html ("Due to the paper-based nature of art transactions, there are numerous provenance and traceability issues related to artworks. The players of the art market still rely on paper certificates and receipts which can easily be lost, tampered with or stolen—and history has shown that fraudulent certificates of authenticity are not uncommon.").

[43] *See, e.g.,* Amy Whitaker, Ownership for Artists, *in* THE SOCIAL LIFE OF ARTISTIC PROPERTY (2014) (arguing that artists should retain partial ownership of their works so that they might participate in the value that they create, using a blockchain system to manage ownership shares of art in a way that would closely resemble corporate ownership).

[44] Fincham, *supra* note 10, at 6.

[45] *Id.* at 5–7 ("In December 2016, then director of the Met Thomas Campbell notified Lebanon that [an ancient 2,300-year-old marble sculpture of a bull's head from Sidon, Lebanon that was then on display at the Met] was likely stolen during the Lebanese Civil War. In January 2017, Sarkis Khoury, the Lebanese directorate general of antiquities, made a formal request for the return of the statue. Later in June 2017, rather than return the stolen statue, the [couple who had purchased the object for $1.2 million in 1996] filed a lawsuit against the Republic of Lebanon and the Manhattan District Attorney's Office, though this lawsuit was eventually dropped, reportedly because the couple was shown evidence that the statue had been stolen. This case illustrates how stolen objects can still enter the gallery of what should be one of the world's great repositories of culture--the Met."); *see also* Derek Fincham, *the Blood Antiquities Convention as a Paradigm for Cultural Property Crime Reduction*, 37 CARDOZO ARTS & ENT. L.J. 299 (2019).

[46] *Id.*

[47] *See* ARTORY, https://www.artory.com (last visited Mar. 26, 2019); VERISART, https://verisart.com/ (last visited Mar. 26, 2019); CODEX PROTOCOL, https://codexprotocol.com/ (last visited Mar. 26, 2019).

[48] *See, e.g*., Fincham, *supra* note 10, at 6 ("[t]he Art Loss Register is a private company that catalogues works of art. However, the registry has been criticized for reporting clean searches of objects of antiquity that are later shown to have been looted or stolen. Because an antiquity may not be catalogued or even known widely, its chances of being reported to the Art Loss Register are extremely low, meaning a clean search of an antiquity with the service means little.").

[49] M. H. Miller, *The Big Fake: Behind the Scenes of Knoedler Gallery's Downfall* ARTNEWS (Apr. 25, 2016, 9:30 AM), http://www.artnews.com/2016/04/25/the-big-fake-behind-the-scenes-of-knoedler-gallerys-downfall/ (stating that "there are certain rules [in the art industry], but chief among them is an almost pathological level of discretion.").

implementation and industry-wide adoption of a blockchain registry seems more practical for discrete categories of physical art and for digital art.[50]

Digital art poses another curious dilemma—one that other cryptocurrencies do not. A coin cannot be replicated the same way art can—while the code of a piece of digital art cannot be replicated, the outward expression of that code, and the artwork itself, can be. As copying technology became more accessible at the end of the twentieth century, copyists were able to copy, adapt, disseminate and publicly display or perform works with little expenditure of effort or money without the copyright holder's permission.[51] Capturing screen images is an easy and common practice that allows a person to essentially take a photograph of what appears on her screen. Consequently, one could make a copy of a piece of digital art by taking a screenshot, and this screenshot could be shared with the world. The artistic expression is no longer scarce; instead, the code holding the original—and best quality—image remains limited. This limitation begs the question: in the world of digital art, what exactly is blockchain protecting?

CONCLUSION

As this Essay briefly explains, there are many benefits to introducing blockchain technology into the art world. However, the benefits of blockchain do not come without its drawbacks, and there are still many open questions about digital art and the law. In order to help us answer these questions, we are excited to invite our two panels of esteemed academics and practitioners in the industry to address emerging issues in digital art and blockchain at our 2019 Spring Symposium.

Jessica Bookout, Lauren Cimbol, Shannon Leigh Collins & Devin L. Newman

---

[50] CryptoKitties and antiquities are two examples. *See, e.g.,* Tonya M. Evans, Cryptokitties, Cryptography, and Copyright: Non-Fungible Digital Creativity on the Blockchain, BYU Copyright and Trademark Symposium (Oct. 8, 2018), *available at* https://copyrightsymposium.copyright.byu.edu/papers/CryptoKitties_Cryptography_and_Copyright.pdf; *see also,* Fincham, *supra* note 10.

[51] *See* Mark A. Lemley & R. Anthony Reese, *Reducing Digital Copyright Infringement Without Restricting Innovation*, 56 STAN. L. REV. 1345, 1375 (2004).