ARIZONA STATE SPORTS AND ENTERTAINMENT LAW JOURNAL

VOLUME 11 SPRING 2022 ISSUE 2

SANDRA DAY O'CONNOR COLLEGE OF LAW
ARIZONA STATE UNIVERSITY
111 EAST TAYLOR STREET
PHOENIX, ARIZONA 85004

SPORTS & ENTERTAINMENT LAW JOURNAL

ARIZONA STATE UNIVERSITY

VOLUME 11 SPRING 2022 ISSUE 2

NEW KIDS ON THE BLOCKCHAIN: A SMART SOLUTION TO COPYRIGHT ASSIGNMENTS & TERMINATIONS

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ABSTRACT

"Blockchain" carries several different meanings, and each application of blockchain-related technology promises innovation and advancement. While many debate its economic viability, blockchain technology has advanced far beyond the financial realm. Smart contracts are simply one example of these advancements. United States copyright law, on the other hand, has adapted to change much more slowly. Assignments of copyright rights, and their eventual terminations, are inconsistently recorded, difficult to achieve, and inefficiently tracked. This frustrates many authors' inalienable right to copyright termination.

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Implementing a permissioned blockchain network to record copyright registrations and mobilizing smart contracts for all copyright assignments eliminates many of the issues that currently plague the United States Copyright Office system. By using the perfectly codable "if-then" statements within the termination statute and regulation, the proposed changes capitalize on modern blockchain advancements while protecting authors and ensuring the public's access to creative works.

INTRODUCTION

The year is 1980: John Lennon was just killed, Pac-Man was released to the clamoring masses, and Victor Miller finished a movie script.[1] The writing process was a whirlwind as he wrote against the clock on a strict budget. The script? "Friday the 13th." In 1980, Miller could not know the circumstances of the script's creation,[2] and its copyright ownership, would be hotly contested in a copyright termination lawsuit over three decades later. Rather, he was busy celebrating.

In 2021, Miller's script and film are legendary. Because over three decades passed, Miller attempted to terminate the copyright rights to the script, as permitted by copyright law. Instead of getting his copyright rights back, Miller got sued. During the litigation, he painstakingly recreated the circumstances of the script's creation, taking the judges back in time to 1980 to show he was entitled to copyright termination. Ultimately, Miller was successful.

It begs the question: do you remember what you were doing over thirty years ago? Does anyone? The United States Copyright Office expects copyright creators to clairvoyantly assign copyright rights to ensure three decades later, their copyright terminations are efficient and successful. This article argues that, with the help of blockchain technology, copyright assignments and terminations can finally join us in the twenty-first century.

Section I explains that uses for blockchain technology reach beyond cryptocurrency. Section II presents blockchain basics, and Section III analyzes smart contracts. Section IV provides an

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[1] Introductory section cites the following: Kyle Jahner, *'Friday the 13th' Copyright Case Is Rare Termination Rights Guide*, BLOOMBERG L. (Oct. 7, 2021, 2:01 AM), https://news.bloomberglaw.com/ip-law/friday-the-13th-copyright-case-is-rare-termination-rights-guide; Horror Inc. v. Miller, 15 F.4th 232 (2d Cir. 2021); *What Happened in 1980 Major Events*, PEOPLE HISTORY, https://www.thepeoplehistory.com/1980.html (last visited Nov. 29, 2021).

[2] *See Horror Inc.*, 15 F.4th 232 (analyzing oral agreements, short form agreements, and the fact that he used his own typewriter ribbon).

overview of the intricacies of exclusive copyright rights and Section V explores the complexities of copyright assignments. Section VI describes an author's inalienable right to then terminate these copyright assignments. Section VII proposes a resolution: smart contract assignments.

I. BLOCKCHAIN: A COIN WITH MANY FACES

"Blockchain" or "Bitcoin" were once terms that, when uttered, prophesied global change of near mythic proportion.[3] They promised a new decentralized page in history in which the "trusted" intermediaries on whom we were previously forced to rely upon would be obsolete, replaced by a "system based on cryptographic proof."[4] Today, "blockchain" is a more nebulous concept. There are cryptographic "coins" that act as investments,[5] money,[6] and novelty items.[7] Blockchain-based distributed ledger technology ("DLT") is also used for applications including supply chain management,[8] storing and transferring a patient's medical information,[9] and real property investments.[10] Unfortunately, blockchain networks have

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[3] *Beyond the Hype: Blockchains in Capital Markets*, *in* 12 MCKINSEY WORKING PAPERS ON CORPORATE AND INVESTMENT BANKING 1, 20 (Kevin Buehler et al. eds., 2015).

[4] *Id.*; *see also* SATOSHI NAKAMOTO, BITCOIN: A PEER-TO-PEER ELECTRONIC CASH SYSTEM 1 (2008).

[5] For example, Bitcoin. Adam Hayes, *How to Buy Bitcoin*, INVESTOPEDIA, https://www.investopedia.com/articles/investing/082914/basics-buying-and-investing-bitcoin.asp (Feb. 28, 2022).

[6] Cade Metz, *In First Day With Bitcoin, Overstock Does $126,000 in Sales*, WIRED (Jan. 10, 2014, 2:07 PM), https://www.wired.com/2014/01/overstock-bitcoin-sales/.

[7] *See* Rob Marvin, *23 Weird, Gimmicky, Straight-Up Silly Cryptocurrencies*, PC MAG. (Feb. 6, 2018) https://www.pcmag.com/news/23-weird-gimmicky-straight-up-silly-cryptocurrencies.

[8] Moritz Berneis, Devis Bartsch & Herwig Winkler, *Applications of Blockchain Technology in Logistics and Supply Chain Management—Insights from a Systematic Literature Review*, 5 MDPI LOGISTICS 43 (June 30, 2021), https://doi.org/10.3390/logistics5030043.

[9] Prasad Kothari et al., *Blockchain Predictions for Health Care in 2021*, 4 BLOCKCHAIN IN HEALTHCARE TODAY 162 (Feb. 10, 2021), http://dx.doi.org/10.30953/bhty.v4.162.

[10] *See generally How Tokenized Real Estate Assets Are Redefining the Market*, NASDAQ, https://www.nasdaq.com/real-estate-asset-tokenization (last visited Nov. 22, 2021).

also been criminally popular. The lack of financial intermediary, a blockchain cornerstone, has attracted otherwise illicit transactions.[11]

When blockchain technology fills a currency-like role—regulatory bodies, specifically those concerned with illegal activity, threaten its universal adoption.[12] Federal regulations broadly define "currency,"[13] potentially opening up cryptocurrencies for federal regulation.[14] The Internal Revenue Service has ensured that cryptocurrencies (or "virtual currencies") are accounted for and taxed appropriately.[15] The 2021 infrastructure bill may further escalate both regulation and taxation in the cryptocurrency arena.[16] Some theorize that intervening regulatory bodies will dash the libertarian dreams of cryptocurrency proponents, preventing the prophecy of global change from being fulfilled.[17]

Whether cryptocurrency adoption can, will, or should replace fiat, or traditional, currency transactions is not relevant for this article's purpose. DLT functions may be adopted into existing systems independently, without having to answer the more metaphysical questions relating to blockchain. Rather, this article focuses on the benefits and solutions blockchain technology can easily provide to an outdated and inefficient system: copyright assignments and terminations.

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[11] David Adler, *Silk Road: The Dark Side of Cryptocurrency*, FORDHAM J. CORP. & FIN. L. BLOG (Feb. 21, 2018), https://news.law.fordham.edu/jcfl/2018/02/21/silk-road-the-dark-side-of-cryptocurrency/.

[12] Todd Phillips, *The SEC's Regulatory Role in the Digital Asset Markets*, CENTER FOR AMERICAN PROGRESS (Oct. 4, 2021), https://www.americanprogress.org/article/secs-regulatory-role-digital-asset-markets/.

[13] 31 C.F.R. § 1010.100(m) ("The coin and paper money. . . that is designated as legal tender and that circulates and is customarily used and accepted as a medium of exchange in the country of issuance.").

[14] Phillips, *supra* note 12.

[15] I.R.S., PUB. NO. 2014-21 (2013), https://www.irs.gov/pub/irs-drop/n-14-21.pdf.

[16] Laura Davison, *How Taxing Crypto Got Changed by Biden's Infrastructure Law*, BLOOMBERG (Nov. 17, 2021, 1:38 PM), https://www.bloomberg.com/news/articles/2021-11-17/how-taxing-crypto-got-changed-by-infrastructure-law-quicktake.

[17] *Compare* Eric Lipton et al., *Regulators Racing Toward First Major Rules on Cryptocurrency*, N.Y. TIMES (Nov. 1, 2021), https://www.nytimes.com/2021/09/23/us/politics/cryptocurrency-regulators-rules.html, *with* Yun Li, *Ray Dalio Says if Bitcoin Is Really Successful, Regulators Will 'Kill It'*, CNBC (Sept. 15, 2021), https://www.cnbc.com/2021/09/15/ray-dalio-says-if-bitcoin-is-really-successful-regulators-will-kill-it.html.

II. ON THE BLOCKCHAIN: HOW IT WORKS

A "blockchain" is a decentralized and public ledger that creates and records transactions, then distributes them across a peer-to-peer network.[18] It is decentralized, meaning no central authority regulates the chain; rather, transactions are authenticated by several computers ("nodes") in a collective network.[19] The authentication process is referred to as "network consensus."[20] Transactions are verified, cleared, and stored through network consensus in a "block," which is then attached or linked to a preceding block, creating an immutable "chain."[21] Hence, "blockchain."

Blockchain networks may take a few different forms.[22] A public network, like Bitcoin, is fully decentralized and public, while a private network is partially decentralized and controlled by a single "highly trusted" organization.[23] The third form is a permissioned network, a hybrid between a fully public and private network.[24] In a permissioned network, the ability to verify, read, and write on the blockchain are controlled by a few predetermined, "permissioned" nodes.[25] This feature makes verification more efficient with no consolidation of controlling power.[26] In Section VII, this article argues a permissioned network would better achieve the goal of copyright assignments and copyright terminations via smart contract.

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[18] Bryce Suzuki, Todd Taylor & Gary Marchant, *Blockchain: How It Will Change Your Legal Practice*, ARIZ. ATT'Y (Feb. 2018), https://www.azattorneymag-digital.com/azattorneymag/201802/MobilePagedArticle.action?articleId=1332400#articleId1332400.

[19] *Id.*; *see also* Sarah Anderson, *The Missing Link Between Blockchain and Copyright: How Companies Are Using New Technology to Misinform Creators and Violate Federal Law*, 19 N.C. J.L. & TECH. 1, 5 (2018), https://scholarship.law.unc.edu/ncjolt/vol19/iss4/1.

[20] Suzuki et al., *supra* note 18 ("Validators verify the correctness of each transaction and maintain consensus among each other regarding the state of the blockchain at any given time.").

[21] *Id.*

[22] David McCarville, *Smart Contracts & Real Estate*, FENNEMORE CRAIG, P.C. - BLOCKCHAIN & CRYPTOCURRENCY 1, 10 (Sept. 21, 2021) (on file with author).

[23] *Id.*

[24] *Id.*

[25] *Id.*

[26] *Id.*

III. SMART CONTRACTS EXPLAINED

Smart contracts are electronic, self-executing instructions that are translated into computer code.[27] Nick Szabo first proposed the principle in 1994, long before blockchain was introduced to the marketplace.[28] Szabo wrote:

> New institutions, and new ways to formalize the relationships that make up these institutions, are now made possible by the digital revolution. I call these new contracts "smart," because they are far more functional than their inanimate paper-based ancestors. No use of artificial intelligence is implied. A smart contract is a set of promises, specified in digital form, including protocols within which the parties perform on these promises.[29]

Szabo equated their function to that of a vending machine, in that a vending machine only releases the requested item into the depository if the customer inserts the correct amount of money, without the need for a clerk to oversee the exchange.[30]

Smart contracts marry traditionally negotiated terms of a contractual agreement with the distributed, decentralized features of a blockchain network.[31] As with a traditional contract, smart contracts are supported by a formal agreement between parties, although drafted in computer code.[32] The parties draft their terms into conditional "if-then" statements, cryptographically "sign" the smart contract and "deploy" it to a blockchain-distributed ledger.[33] Once a condition is satisfied, the smart contract executes its coded response, like executing payment following the receipt of goods.[34] Indeed, smart contracts were designed to function alongside

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[27] Reggie O'Shields, *Smart Contracts: Legal Agreements for the Blockchain*, 21 N.C. BANKING INST. 177, 181 (2017), http://scholarship.law.unc.edu/ncbi/vol21/iss1/11.

[28] NICK SZABO, SMART CONTRACTS: BUILDING BLOCKS FOR DIGITAL MARKETS (1996), https://www.fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vwh.net/smart_contracts_2.html.

[29] *Id.*

[30] *Id.*

[31] O'Shields, *supra* note 27, at 179.

[32] *Id.*

[33] *Id.* at 179.

[34] *Id.*

blockchain technology and inherit several blockchain features, like immutability and security.[35]

A simple use-case demonstrates a smart contract's function. Assume a market asks a farmer for 100 ears of corn and the two parties negotiate price and a delivery date.[36] The market locks its funds into a smart contract and translates the following terms into code: *if* farmer delivers 100 ears of corn by June 1, *then* market pays $100 to farmer.[37] If the farmer misses the delivery date, the contract self-cancels; however, if the farmer timely delivers, the contract self-executes and the funds are deposited into the farmer's account.

A. ORACLES

A smart contract easily reviews internal ("on-chain") information through its blockchain network as network nodes verify transactions and reach consensus.[38] Smart contracts cannot directly access real-world ("off-chain") information.[39] Off-chain information exists outside of the blockchain, like prices, weather reports, or election results.[40] In order for a smart contract to determine whether a "if-then" statement conditioned on a real-world event triggers, it requires a data oracle to act as its bridge between the blockchain and off-chain information.[41] Oracles post off-chain data onto the blockchain, so that nodes may verify it and incorporate it onto the network.[42] An oracle may also be bi-directional, allowing a smart contract to send data off the chain.[43]

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[35] *Id.* at 181; *see also* Martín Buttazzi, *What Are Smart Contracts, and How Can We Benefit From Them?*, HEXACTA (Nov. 2, 2020), https://www.hexacta.com/what-are-smart-contracts-and-how-can-we-benefit-from-them/.

[36] *What Are Smart Contracts? A Beginner's Guide to Automated Agreements*, COINTELEGRAPH, https://cointelegraph.com/ethereum-for-beginners/what-are-smart-contracts-a-beginners-guide-to-automated-agreements (last visited Dec. 2, 2021) [hereinafter *What Are Smart Contracts?*].

[37] *Id.*

[38] *Oracles*, USE ETHEREUM (Jan. 3, 2022) https://ethereum.org/en/developers/docs/oracles/.

[39] *Id.*

[40] *Id.*

[41] *Id.*

[42] *Id.*

[43] *Id.*

B. ENFORCEABILITY OF SMART CONTRACTS

Smart contracts are also legally enforceable. With traditional contracts, courts analyze whether the common law requirements of offer, acceptance, and consideration are satisfied in determining legal enforceability.[44] Where a traditional contract is legally enforceable, it follows that its coded smart contract terms would also be enforceable.[45]

Many legal developments have bolstered digital contract enforceability. The Uniform Electronic Transactions Act ("UETA"), enacted in 1999 and adopted by forty-seven states provides that, with few exceptions, a computer programs' electronic record and accompanying electronic signatures have the same legal effect as if written traditionally.[46] UETA also recognizes the validity of "electronic agents," defined as "a computer program or an electronic or other automated means used independently to initiate an action or respond to electronic records or performances in whole or in part, without review or action by an individual."[47]

Additionally, the Electronic Signatures Recording Act ("E-Sign Act") recognizes the validity of electronic records and signatures in interstate commerce, going further than the UETA.[48] The E-Sign Act also provides that a transaction's digital contract or record "may not be denied legal effect, validity, or enforceability solely because its formation, creation, or delivery involved the action of one or more electronic agents" if it can be "legally attributable to the person to be bound."[49] Even if traditional legal principles fail to find that a smart contract operating on a blockchain network is a legal "contract," the paradigm has already shifted in favor of doing so. Some states like Arizona and Nevada have already changed their iterations of the UETA to expressly sanction blockchain networks and smart contracts.[50]

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[44] Stuart D. Levi & Alex B. Lipton, *An Introduction to Smart Contracts and Their Potential and Inherent Limitations*, HARV. L. SCH. F. ON CORP. GOVERNANCE (May 26, 2018), https://corpgov.law.harvard.edu/2018/05/26/an-introduction-to-smart-contracts-and-their-potential-and-inherent-limitations/.

[45] *Id.*

[46] *Id.*; *see also* Unif. Elec. Transactions Act § 5 (Unif. L. Comm'n 1999).

[47] Unif. Elec. Transactions Act § 2(6).

[48] 15 U.S.C. § 7001(h).

[49] *Id.*

[50] *See* 2017 Ariz. H.B. 2417; Nev. Rev. Stat. Ann. § 719.090 (2018).

C. SMART CONTRACT PROS & CONS

Smart contracts inherit several benefits from operating on blockchain networks.[51] These benefits include the lack of a third-party intermediary and irreversible transactions.[52] Additionally, smart contracts offer: (1) transparency, as blockchain nodes acknowledge the terms and store them in a decentralized architecture; (2) affordability, minimizing transaction and agency costs through self-verification and execution; (3) autonomy through self- execution of the contracts themselves, and; (4) efficiency, as they replace the analog processes of the traditional contract system.[53]

However, using a smart contract is not always, well, *smart*. First, though they are eventually translated into code and maintained on the blockchain, the initial programming is done by hand.[54] Human error is still possible, leading to potential vulnerabilities.[55] Smart contracts are also not easily amended because of their immutability.[56] It can be difficult to fix errors. Though smart contracts are "self-executing," transferring tangibles like real property or money through blockchain transactions is not always effective.[57] Yet another criticism of smart contracts attacks their defining feature: objectivity.[58] By their very nature, smart contracts "cannot include ambiguous terms nor can certain potential scenarios be left unaddressed."[59] Finally, smart contracts do not easily handle complex transactions. Reaching network consensus demands simple instructions.[60]

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[51] Buttazzi, *supra* note 35.

[52] *Id.*

[53] *Id.*

[54] *What Are Smart Contracts?*, *supra* note 36.

[55] *See, e.g.*, Ernesto Frontera, *A History of 'The DAO' Hack*, COINMARKETCAP (Nov. 6, 2021), https://coinmarketcap.com/alexandria/article/a-history-of-the-dao-hack.

[56] Levi et al., *supra* note 44.

[57] *Id.* For example, where the property subject to a smart contract conveyance is destroyed, or where a payor has insufficient funds, the network merely verifies that the condition-precedents to the transfer have been satisfied—not that the transfer actually occurred. *See also* Ivan Kot, *Smart Contracts in Real Estate: Still Room for Perfection*, FINEXTRA (Nov. 27, 2020), https://www.finextra.com/blogposting/19557/smart-contracts-in-real-estate-still-room-for-perfection.

[58] Levi et al., *supra* note 44.

[59] *Id.*

[60] Kot, *supra* note 57.

Nevertheless, smart contracts excel in simple "if-then" transactions, like intellectual property assignments.

IV. OFF THE CHAIN: COPYRIGHT RIGHTS

Perhaps not every transaction belongs on the blockchain.[61] However, copyright complexities and rationale demonstrate why copyright is perfectly positioned to take advantage of this new, decentralized era.[62]

A. INTRODUCING: COPYRIGHT

Since the dawn of American time, one thing has been clear—the framers of the Constitution cared about copyright. In 1783, the Continental Congress passed a resolution that encouraged the states to adopt copyright laws.[63] James Madison argued for copyright protections in his Federalist Papers and helped draft Article I, Section eight, Clause eight of the Constitution—the Copyright Clause.[64] Pursuant to the Copyright Clause, Congress enacted the Copyright Act to "promote the Progress of Science," by granting "authors" certain exclusive rights in their "original works of authorship."[65] The first federal Copyright Act was enacted in 1790, with major revisions in 1909 and in 1976.[66] This article focuses on the Act of 1976 (the "Act"), which governs all recently created works.[67]

The value of copyright lies is in the incentive it creates. Copyright establishes a marketable right to the use of one's expression, while it also supplies the economic incentive to create and disseminate ideas.[68] Copyright law continuously balances an

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[61] *See* Martin Glazier, *Enterprise Blockchain Doesn't Work Because It's About the Real World*, COINDESK, (Mar. 31, 2021), https://www.coindesk.com/markets/2021/03/31/enterprise-blockchain-doesnt-work-because-its-about-the-real-world/.

[62] For our purposes here, the existence of an author and a copyrightable work are assumed. *See* 17 U.S.C. § 102(a).

[63] 24 JOURNALS OF THE CONTINENTAL CONGRESS, 1774–1789, AT 326–27 (Gaillard Hunt ed., Government Printing Office, 1922).

[64] U.S. CONST. art. I, § 8, cl. 8; Craig W. Dallon, *Original Intent and the Copyright Clause: Eldred v. Ashcroft Gets It Right*, 50 ST. LOUIS U. L.J. (2006) (citing *The Federalist No.* 43, at 222).

[65] 17 U.S.C. § 102.

[66] *Copyright Timeline,* ASS'N RSCH. LIBR., https://www.arl.org/copyright-timeline/ (last visited Feb. 28, 2022).

[67] 17 U.S.C. § 102.

[68] Harper & Row Publishers, Inc. v. Nation Enterprises, 471 U.S. 539, 557 (1985).

author's incentive to create with providing the public access to creative works.[69] The Act aims to ensure that the rights granted to authors are not so broad that authors can fully limit the public's access; likewise, that the public's access is not so broad that authors are disincentivized to create.[70]

The "author"[71] of an "original"[72] copyrightable work receives a bundle of divisible, intangible copyright rights in their work from the point of "fixation."[73] Simply, once an author gives their creative works a tangible form—they receive copyright rights that exist separately from the work's material object. Subject to limited exception, these rights are also exclusive to the author under Section 106 of the Act.[74] Section 106 empowers the original author to exclusively capitalize on their creations, for example, by creating copies or derivatives.[75] Additionally, an author has exclusive rights as to each copyright layer.[76] If the author pens an original composition on sheet music and then records it, the author's Section 106 rights extend to both the musical composition (the notes and lyrics) and the sound recording.[77]

The author may also transfer any of the author's exclusive rights (an assignment) or permit others to use the work (an exclusive or

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[69] Twentieth Century Music Corp. v. Aiken, 422 U.S. 151, 156 (1975) ("The immediate effect of our copyright law is to secure a fair return for an 'author's' creative labor. But the ultimate aim is, by this incentive, to stimulate artistic creativity for the general public good.").

[70] *See generally* Sara K. Stadler, *Incentive and Expectation in Copyright*, 58 HASTINGS L.J. 3, 433 (2007).

[71] "One to 'whom anything owes its origin.'" Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53, 58 (1884).

[72] 17 U.S.C. § 102.

[73] A work is fixed "when its embodiment . . . is sufficiently permanent or stable to permit it to be perceived." 17 U.S.C. §§ 101, 102(a); Sebastian Pech, *Copyright Unchained: How Blockchain Technology Can Change the Administration and Distribution of Copyright Protected Works*, N.W. J. TECH. & INTELL. PROP. 1, 6 (2020).

[74] 17 U.S.C. § 106 ("They include the right to: (1) to reproduce the copyrighted work; (2) to prepare derivatives of the copyrighted work; (3) to distributed copies of the copyrighted work; (4) to publicly perform the copyrighted work; (5) to publicly display the copyrighted work, and; (5) to digitally perform the work if it is a sound recording.").

[75] *Id.*

[76] *Copyright Permissions: Understanding Layers of Rights*, COPYRIGHTLAWS.COM (Feb. 11, 2019), https://www.copyrightlaws.com/copyright-permissions-layers-of-rights/.

[77] *Id.*, *see also* 17 U.S.C. § 101.

non-exclusive license).[78] Transferring ownership of the copyrighted material does not convey the author's exclusive rights.[79] Rather, a consumer must expressly contract for an assignment of the rights.[80] Disputes as to whom authorship is attributed and which rights have been assigned often arise because exclusive rights are granted in, and generally remain with, the original author. [81] Whether the work was properly registered determines whether the rights can be enforced at all.

B. ENFORCING COPYRIGHT RIGHTS

Authors may not enforce their exclusive rights in a copyrightable work of U.S. origin unless they also register the work with the United States Copyright Office ("USCO").[82] In addition to granting the author, now the work's registered copyright holder, legally enforceable copyright ownership, registration provides the author with prima facie evidence of valid copyright ownership and establishes a publicly recorded claim to a copyrighted work.[83]

Through this process, all enforceable, copyrighted works within the U.S. are registered with the USCO. Registration is simple. It requires logging into the USCO website, entering relevant data about the work and its date and circumstances of fixation, paying a fee, and uploading a copy to be maintained with the Library of Congress.[84] Theoretically, this creates a record that can be easily accessed and verified, that is also difficult to change—similar to a blockchain network.

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[78] "The author may transfer all or a subset of these rights 'by any means of conveyance or by operation of law.'" John Wiley & Sons, Inc. v. DRK Photo, 882 F.3d 394, 410 (2d Cir. 2018) (quoting § 201(d)(1)).

[79] 17 U.S.C. § 202.

[80] 17 U.S.C. §§ 109, 202.

[81] *See, e.g.*, Silvers v. Sony Pictures Ent., Inc., 402 F.3d 881 (9th Cir. 2005).

[82] "No civil action for infringement of the copyright in any United States work shall be instituted until preregistration or registration of the copyright claim has been made in accordance with this title." 17 U.S.C. § 411(a).

[83] *Copyright Basics*, COPYRIGHT.GOV (Oct. 17, 2021), https://www.copyright.gov/circs/circ01.pdf.

[84] *Register Your Work: Registration Portal*, COPYRIGHT.GOV, https://www.copyright.gov/registration/ (last visited Oct. 17, 2021).

V. COPYRIGHT ASSIGNMENT CONTRACTS[85]

Unfortunately, the consistency and reliability of copyright recordkeeping ends at registering the work.

A. SIGNED WRITING REQUIREMENT

If a copyright holder wishes to fully transfer an exclusive right or use of their work, it must be contractually transferred.[86] An assignment must be in writing and signed by the rights owner, under Section 204(a) of the Act.[87] However, the assignment does not have to be recorded with the USCO to be valid.[88]

These inconsistent recordation mechanisms cause confusion and could affect the validity of a copyright transaction.[89] Consider an author who fully assigns their properly registered, copyrighted work to Party 1. The author does not record the assignment. The USCO record would still (correctly) reflect the work is registered, but incorrectly reflect the copyright's owner. The original author then mistakenly or fraudulently executes a second assignment of the work to Party 2. Because the first assignment was not recorded, Party 2 reviews the USCO records and sees the original author owns the rights to the work. However, this second transaction fails. The author conveyed rights to a work that they no longer had, and Party 2 captured none of the rights they believed they were purchasing.[90]

The system's flaw is exacerbated by the nature of copyrighted works. Complex assignment contracts may be too difficult to comprehend or too vague.[91] Multiple, successive assignments to multiple assignees can raise a dispute when parties attempt to enforce their rights.[92] Assignments get more complicated when the work is a work made for hire, if the original author dies and passes

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[85] Herein, "assignment" means both an assignment and an exclusive license—both requiring a signed writing.

[86] 17 U.S.C. § 204(a).

[87] *Id.*

[88] Pech, *supra* note 73, at 6.

[89] *Id.* at 6-8.

[90] Josh Conley, *The Use of Blockchain in Intellectual Property Management*, ZARLEY L. (Mar. 22, 2018), https://www.zarleylaw.com/the-use-of-blockchain-in-intellectual-property-management/.

[91] John Wiley & Sons, Inc. v. DRK Photo, 882 F.3d 394, 410 (2d Cir. 2018).

[92] *See, e.g.*, Ackoff-Ortega v. Windswept Pac. Ent. Co., 120 F. Supp. 2d 273, 275 (S.D.N.Y. 2000) (three assignments to different assignees caused a dispute when parties were unclear who held renewal rights).

their copyright rights to an heir, or both.[93] While a confusing copyright assignment may cause controversy and frustration, an assignment cannot transfer an author's termination right.

VI. TERMINATION RIGHTS

Assignments of copyright rights may later be terminated by the original author. In pursuit of the balance between author incentive and public access, copyright protection is subject to limited duration. Prior to the Copyright Act of 1976, authors of a copyrighted work enjoyed an initial term of copyright ownership, with an additional term if the copyright was properly renewed.[94] The purpose for renewal rights was to benefit authors by allowing them to recapture the rights to works that later became successful.[95] The incentive to the author was a "second bite at the apple."[96] The benefit to the public, if the author opted out of their renewal right, was more works in the public domain.[97]

After *Fred Fisher Music Co. v. M. Witmark & Sons*, it became clear that renewal rights, as written, did not fully serve their intended purpose.[98] The Court held that renewal rights were property and thus freely transferable by contract.[99] After this controversial decision, nearly all copyright assignments also conveyed the renewal rights, which reduced the likelihood an author would ever get their "second bite at the apple."[100] Shortly thereafter, renewal rights were out, and termination rights were in.

A. INALIENABLE TERMINATION RIGHTS

To help ensure authors got the protection intended by renewal rights, the Copyright Act of 1976 granted authors *inalienable* termination rights.[101] Section 203(a)(5) states that terminating assigned copyright rights may take effect "notwithstanding any

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[93] *See* Marvel Characters, Inc. v. Kirby, 726 F.3d 119 (2d Cir. 2013) (heirs of a freelance artist whose art depicted iconic Marvel characters attempted to enforce their rights, while the defendant claimed they were works made for hire).

[94] 17 U.S.C. § 23.

[95] William Patry, *Choice of Law and International Copyright*, 48 AM. J. COMP. L. 383, 446 (2000).

[96] *Id.*

[97] *Id.*

[98] *See* Fred Fisher Music Co. v. M. Witmark & Sons, 318 U.S. 643, 651 (1943).

[99] *Id.*

[100] Patry, *supra* note 95.

[101] *Id.* (emphasis added).

agreement to the contrary."[102] Because this right is not assignable, authors are free to decide how to use it. "Some artists may choose to exercise their termination right and reclaim ownership of their work. Other artists may use it as leverage to negotiate (or renegotiate) a better deal."[103]

The court in *Waite v. Universal Music Group* summarized the purpose of the termination right thus:

> Aspiring singers, musicians, authors and other artists—sometimes young and inexperienced and often not well known—tend to have little bargaining power in negotiating financial arrangements with recording companies, publishers, and others who promote and commercialize the artists' work. They often grant copyright in that work as part of the bargain they strike for promotion and commercialization. Accordingly, when an artistic work turns out to be a "hit," the lion's share of the economic returns often goes to those who commercialized the works rather than to the artist who created them . . . The idea was that termination of these rights would more fairly balance the allocation of the benefits derived from the artists' creativity.[104]

Today, authors may freely assign their exclusive Section 106 rights, while the right to terminate these assignments remains inalienable. But how does one enforce termination?

B. DETERMINING TERMINATION ELIGIBILITY

Copyright ownership is a temporal analysis. The term for an initial copyright ownership is measured by the life of an author, plus seventy years.[105] However, if the author assigned their copyright to a second party, a thirty-five-year termination clock begins to tick.[106]

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[102] 17 U.S.C. § 203(a)(5) (excluding works made for hire).

[103] Dylan Gilbert et al., *Making Sense of the Termination Right: How the System Fails Artists and How to Fix It*, PUB. KNOWLEDGE (Dec. 2019), https://publicknowledge.org/policy/making-sense-of-the-termination-right-how-the-system-fails-artists-and-how-to-fix-it/.

[104] Waite v. UMG Recordings, Inc., 450 F. Supp. 3d 430, 432 (S.D.N.Y. 2020).

[105] 17 U.S.C. § 302(a).

[106] 17 U.S.C. § 203(a)(1)-(3).

For assignments made after January 1, 1978, authors have the right to terminate an assignment thirty-five years after the transfer was made.[107] Section 203 provides several calculations to help an author determine when they are eligible to terminate copyright assignments and recapture their rights.[108] Authors are given a five-year notice window that starts in the thirty-fifth year.[109] Before the copyright may be terminated, notice must be served to all current copyright holders between two and ten years prior to the end of the termination period, or, as early as year twenty-five and as late as year thirty-eight.[110]

Confusing? The USCO provides helpful "if-then" charts to determine termination eligibility:[111]

SECTION 203: Grants Executed by the Author on or after January 1, 1978, that did not Convey the Right of Publication

SELECT A DATE OF TERMINATION			DEADLINES FOR SERVING AND RECORDING A NOTICE OF TERMINATION		
			The **Notice of Termination** must be served on the grantee and recorded with the Copyright Office *before* the **Date of Termination**.		
If the grant was executed on Date X in the Year...	...then the **Date of Termination** must be between...		If the **Date of Termination** is Date Y in the Year...	...then the **Notice** must be served *on or after* Date Y in the Year...	...and the **Notice** must be served *before* Date Y in the Year
	Date X in the Year	and Date X in the Year			
1978	2013	2018	2013	2003	2011
1979	2014	2019	2014	2004	2012
1980	2015	2020	2015	2005	2013
1981	2016	2021	2016	2006	2014
1982	2017	2022	2017	2007	2015
1983	2018	2023	2018	2008	2016
1984	2019	2024	2019	2009	2017
1985	2020	2025	2020	2010	2018
1986	2021	2026	2021	2011	2019
1987	2022	2027	2022	2012	2020

C. SMALL ERRORS, BIG CONSEQUENCES

The intricate process for serving and recording notice is codified in 37 C.F.R. § 201.10. The notice of termination must include a statement of statutory authority,[112] the name of each assignee whose rights are being terminated, a brief statement that reasonably identifies the assignment, the effective date of

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[107] *Id.* at (a)(3).

[108] *Id.*

[109] *Id.*

[110] *Id.* at (a)(4).

[111] *See, e.g.*, *Termination Table § 203*, U.S. COPYRIGHT OFFICE, https://www.copyright.gov/comp3/docs/termination-table-section203rp.pdf (last modified Jan. 2019).

[112] 37 C.F.R. § 201.10 (covering notices of termination under §§ 203, 304(c), or 304(d)).

termination, and several other items when applicable to the circumstances.[113] The terminating party must make a reasonable inquiry to determine where to send the notices, and the notices must be sent via first class or certified mail.[114] The original author, or in the case of a joint work, a majority of the original authors, must sign the notices.[115]

To file a termination notice is to walk a precariously thin line. Failing to comply with the notice formalities before the termination period expires may result in a failed copyright termination effort.[116] However, if the author complies with the formalities, the USCO records the termination notice; once the thirty-five-year period is exhausted, the author recaptures their rights.[117]

The middle ground between compliance and noncompliance is hazy. While there is a "harmless error" provision that permits the notice to remain effective regardless of an immaterial mistake, there is also no clear process in place for amending a recorded notice.[118] Additional factors further muddy the waters, depending on how many copyright assignments were conveyed over the termination period's three decades, how many authors and assignees have since moved or died, and how many layers of copyright were involved.

VII. SMART CONTRACTING: RESOLVING EXISTING COPYRIGHT ASSIGNMENT AND TERMINATION PROBLEMS

The issue is that copyright assignments can be confusing and complicated, and though the author retains an inalienable right to terminate them, the outdated USCO system means an author may struggle to enforce termination. A solution forms when smart contracts, copyright assignments, and termination are brought together. Specifically, copyright assignments should be executed as

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[113] *See id.* § 201.10(b).

[114] *See id.* § 201.10(d).

[115] *See id.* § 201.10(b).

[116] *Id.*; Mtume v. Sony Music Ent., 408 F. Supp. 3d 471, 476 (S.D.N.Y. 2019) (incorrectly calculated date of termination may or may not have been a harmless error); Burroughs v. Metro-Goldwyn-Mayer, Inc., 491 F. Supp. 1320, 1326 (S.D.N.Y. 1980), *aff'd*, 636 F.2d 1200 (2d Cir. 1980) (notice omitted five titles and was served prior to the effective date, thus termination notice failed).

[117] 37 C.F.R. § 201.10.

[118] *See* Siegel v. Warner Bros. Ent. Inc., 658 F. Supp. 2d 1036, 1093 (C.D. Cal. 2009) (noting "differing views on how stringent courts should be in applying the harmless error safety valve").

smart contracts on a permissioned USCO network. Because assignments must be conveyed by contract, the current system is ripe for blockchain adoption.

A. FIRST: ADOPT A PERMISSIONED USCO NETWORK

Fully addressing the current system's inefficiencies requires adopting a permissioned blockchain network at the USCO level. A permissionless network means that a blockchain operating on the network is verified by several public nodes.[119] It is fully decentralized across unknown parties, with no central authority.[120] However, these features are not desirable here. Rather, a permissioned network allows for more control and efficiency.[121] A permissioned network allows only designated nodes to interact and participate in consensus validation, and the network is distributed across known parties.[122] These networks are highly customizable, and fewer nodes means swifter (and more environmentally friendly) network consensus.[123]

Adopting a permissioned network at the USCO level means all copyright registrations and assignments would be captured. Merely arguing for moving assignments on-chain does not resolve current issues, as blockchains operating on different networks may not interact with each other.[124] This would mean assignments could be as confusing as they are today. Rather, adopting a permissioned network at the copyright mothership brings all registrations and assignments under its umbrella, much like the early "internet" conjoined disparate computer networks into a singular internet protocol suite.[125]

Additionally, a bi-directional data oracle would monitor off-chain information, like calendar dates, and changes to a party's address.[126] A bi-directional oracle would allow for the copyright

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[119] Jessica Groopman, *Permissioned vs. Permissionless Blockchains: Key Differences*, TECHTARGET (June 1, 2021), https://searchcio.techtarget.com/tip/Permissioned-vs-permissionless-blockchains-Key-differences.

[120] *Id.*

[121] *See id.*

[122] *Id.*

[123] *Id.*

[124] Mike Orcutt, *How to Get Blockchains to Talk to Each Other*, MIT TECH. R. (May 24, 2018), https://www.technologyreview.com/2018/05/24/142734/how-to-get-blockchains-to-talk-to-each-other/.

[125] *Id.*

[126] *See, e.g.*, *Using Oracle Intelligent Track and Trace*, ORACLE CLOUD (Mar. 2022), https://docs.oracle.com/en/cloud/saas/track-and-trace-cloud/user-guide/using-oracle-intelligent-track-and-trace.pdf.

termination information housed on-chain to be transferred off-chain, like sending termination notices to assignees and notices of recordation to authors via first class mail.[127]

While it may seem unreasonable to expect the USCO to adopt such wide-sweeping reform, change is already upon us. Federal government processes have already begun to adopt DLT, using private developers working on government contracts to write and implement DLT programs.[128] Using government contract resources also means the USCO can incorporate its own permissioned network into existing infrastructure without having to code the program itself, presenting a streamlined consumer interface to the public with relatively minimal government involvement.[129]

B. SECOND: ASSIGNMENT CONTRACTS, BUT MAKE THEM SMART

In addition to altering existing processes, this article proposes a new, mandatory third step: recording assignments as smart contracts with the USCO network. A copyright author already registers their copyright with the USCO, but with a permissioned network in place, each initial copyright registration would place copyright ownership "on-chain." This allows for future, swifter network consensus in subsequent assignments.

Next, parties would negotiate their assignment terms and, register them on the USCO network. They would enter data in the provided fields regarding: (a) to whom ownership transfers; (b) which rights are being assigned; (c) where to send notices, and; (d) when the assignment terminates. This process essentially eliminates all of the current system's failings. It correctly records copyright assignments with the USCO, tracks new rights holders' identities and addresses, and cleanly builds in a copyright termination trigger, with the date calculated in advance.

Finally, instead of sending the current copyright holder a notice of copyright termination directly, the copyright author would signal the termination intent to the network.[130] This places the author's

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[127] *See Oracles*, *supra* note 38.

[128] *See, e.g.*, *Simba Chain, Inc.*, GOVTRIBE (2018), https://govtribe.com/vendors/simba-chain-inc-dot-87b18.

[129] *Bringing the Blockchain to the Federal Government Contracting Workspace, Part I*, WARD & BERRY, PLLC (Mar. 18, 2021), https://www.wardberry.com/bringing-the-blockchain-to-the-federal-government-contracting-workspace-part-i/.

[130] Signing the smart contract could likely satisfy current USCO notice requirements under the UETA/E-Signature Act.

intent to terminate on-chain. The smart contract would not send a termination notice to the rights holders until the condition-precedent, the statutory termination notice period, triggers. Once the rights holders receive notice of the author's copyright termination, the parties can negotiate the termination and the terms of the assignment, as they currently do.

1. *BUILT-IN "IF-THEN" CODING*

Copyright assignments and the termination statute are already built on a foundation of straightforward conditional statements.[131] Here, the coded conditions of the smart contract could include: recording the identities of successive owners ("*if* UMG transfers $1,000 to Waite, *then* USCO records UMG as the copyright owner"); transferring the value itself ("*if* Waite assigns ownership, *then* UMG transfers $1,000 to Waite"); and, stating which rights are conveyed ("*if* UMG transfers $1,000 to Waite, *then* Waite assigns all exclusive rights to UMG"), and when they terminate ("*if* Waite triggers termination, *then* USCO sends termination notice to UMG"). Additionally, since agreements to transfer the inalienable termination right are unenforceable, the right underlying the conditional termination trigger cannot erode over time.

One of the difficulties of recapturing copyright rights by terminating an assignment under the current system is the likelihood that the author's successor would also assign their copyright rights to a second party, and that second party to a third. Considering their immutability, this is also a limitation for smart contracts. Successive copyright assignments would benefit from DLT as each assignment would be recorded on the USCO's blockchain network. However, executing this with a smart contract is more difficult than merely assigning the smart contract to successive parties.

One means to circumvent the issue of successorship is to bifurcate the smart contracts into "master" and "alternate" contracts.[132] This leverages the technical ability of a smart contract by programing an alternate contract to "call" the master contract, amending the master contract at a later date.[133] This codes the initial assignment to redirect (call) the master smart contract to an alternate smart contract.[134] Doing so would permit the original author to still satisfy the notice condition, triggering the original termination condition, through successive ownership transfers from the

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[131] *See supra* chart accompanying note 111.

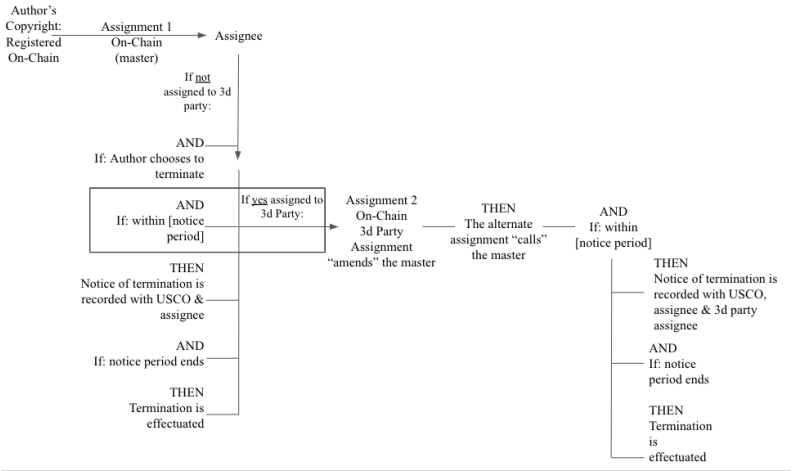
[132] Jeffrey D. Neuburger et al., *Smart Contracts*: *Best Practices*, *in* PRACTICAL L., Westlaw w-022-2968 (2022).

[133] *Id.*

[134] *Id.*

intervening thirty-five years. This amendment process is protected by the USCO's permissioned network, as only authorized nodes will digest the on-chain network data and the oracle's off-chain data to reach consensus as to the successive assignments.

Below is a simplified example of a smart contract decision tree [135] demonstrating the "if-then" conditions and subsequent assignments:



2. *ADDRESSING ARGUMENTS AGAINST SMART CONTRACT UTILITY*

Section III of this article raised several arguments against smart contract utility. After presenting the proposed solution, these arguments are easily countered. First, human error is already rampant in copyright terminations; however, using a permissioned network with simplified data fields eliminates current human error and makes future error less likely. Second, while amending smart contracts is usually difficult, using the same permissioned network that houses a master contract to call the master's data in subsequent assignments allows for open-ended transactions from the outset. Third, while transferring tangibles in blockchain transactions is not always effective, copyright rights are intellectual and thus, intangible property. Merely recording the assignments captures the rights, with no off-chain property transfers needed. Finally, copyright assignments and terminations are already objective, relatively simple "if-then" statements. Therefore, while some agreements may still be too complex to be moved on-chain,

[135] Created with the help of Prof. Bryce Suzuki (Nov. 23, 2021).

copyright assignments and terminations are practically begging for the shift.

3. *POLICY SUPPORT*

Protecting an author's right to terminate copyright assignments is supported by the policy behind termination. Copyright rights are an author's incentive to create for the benefit of the public.[136] Ensuring the termination process is accurate and efficient furthers this incentive without expanding an author's existing rights. Similarly, requiring the author to trigger the copyright termination right also closely mirrors the current process, without making termination an automatic right.

VIII. CONCLUSION

"Blockchain" promises innovation to come. While many debate its place in our economy, blockchain technology has quickly advanced beyond the realm of money. One such application is that of the smart contract. Meanwhile, United States copyright law has adapted to change much slower. Assignments of copyright rights are inconsistently recorded with the USCO, frustrating an author's inalienable right to terminate those assignments.

Implementing a permissioned blockchain network to record copyright registrations and mobilizing smart contracts for all copyright assignments essentially eliminates the issues that currently plague the USCO system. The USCO can easily contract-out the network design and incorporate it into its existing platform, using the already perfectly codable "if-then" statements within the termination statute and regulation. Adopting these changes allows copyright assignments and future copyright terminations to reap the benefits of the blockchain.

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[136] Twentieth Century Music Corp. v. Aiken, 422 U.S. 151, 156 (1975).