

# Blockchain and Intellectual Property Rights

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## INTRODUCTION

In 2008, Satoshi Nakamoto published a paper describing a form of digital money that he called ‘Bitcoin.’<sup>1</sup> His paper suggested the clever use of cryptography techniques to create a purely virtual, decentralized currency that operates without the need for an authority to confirm all transactions,<sup>2</sup> thus sidestepping the middleman.<sup>3</sup>

Eight years after its creation, Bitcoin’s price exploded in 2017, which led to widespread awareness of its existence and a proliferation of other digital coins that were also based on blockchain technology.<sup>4</sup> Its boom added to discussions about blockchain and its weaknesses,<sup>5</sup> particularly given blockchain’s widespread adoption in black markets.<sup>6</sup> Regulators and thought leaders debated its dangers<sup>7</sup> and the need for regulatory oversight.<sup>8</sup> Without

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1. *Frequently Asked Questions*, BITCOIN, <https://bitcoin.org/en/faq#what-is-bitcoin> [<https://perma.cc/87MZ-A4LK>].

2. SATOSHI NAKAMOTO, BITCOIN: A PEER-TO-PEER ELECTRONIC CASH SYSTEM (2009), <https://bitcoin.org/bitcoin.pdf> [<https://perma.cc/LHN7-KP2H>].

3. PRIMAVERA DE FILIPPI & AARON WRIGHT, BLOCKCHAIN AND THE LAW: THE RULE OF CODE 20, (Harv. Univ. Press 2019).

4. Oscar Williams-Grut, *Bitcoin Turns 10: An Annotated Timeline*, YAHOO!FIN. (Oct. 31, 2018), <https://finance.yahoo.com/news/history-bitcoins-first-decade-one-chart-003220581.html> [<https://perma.cc/8G57-PL6P>].

5. GARRICK HILEMAN & MICHEL RAUCHS, GLOBAL BLOCKCHAIN BENCHMARKING STUDY 16–19 (2017).

6. ADITYA AGASHE, PARTH DETROJA & NEEL MEHTA, BUBBLE OR REVOLUTION? THE PRESENT AND FUTURE OF BLOCKCHAIN AND CRYPTOCURRENCIES 54–57 (Paravane Venturess, 1st ed., 3rd rev. 2019).

7. *See generally* Sean Foley, Jonathan R. Karlsen & Tālis J. Putniņš, *Sex, Drugs, and Bitcoin: How Much Illegal Activity Is Financed Through Cryptocurrencies?*, 32 REV. FIN. STUD. 1798, 1840–47 (2019).

8. *See* Kevin Werbach, *Trust, But Verify: Why the Blockchain Needs the Law*, 33 BERKELEY TECH. L.J. 487, 495 (2018).

those protections, cryptocurrency markets took on the feel of the Wild West of the financial world,<sup>9</sup> attracting individuals with nefarious intentions.<sup>10</sup>

Yet, blockchain technology could transform governments and society. In fact, it might become the most revolutionary breakthrough of the twenty-first century and the most important technological leap since the advent of the Internet.<sup>11</sup> That said, even though the Federal Bureau of Investigation (“FBI”) shutting down Silk Road in 2013 showed that blockchain is not above the law,<sup>12</sup> it seems only reasonable that governing authorities should worry about an environment that is not, and cannot be, fully controlled.<sup>13</sup> Seeing the potential for chaos, governments have sought to regulate these emerging markets. Currently, we can see a race in jurisdictions as to who will govern blockchain technologies, and how. This race could and should be finished simultaneously. There is a need for cooperation amongst countries to prevent blockchain’s vulnerabilities from manifesting into problems.<sup>14</sup>

The potential scope and scale of such problems are apparent from just how many areas of law and society are affected by these innovative technologies. One such area that may be revolutionized by blockchain technology is intellectual property (“IP”) law. In the near future, thanks to blockchain technology, we may see a crucial shift in the creation and maintenance of intellectual property rights (“IPRs”). What we already know is that we need to make blockchain policy trustworthy in all of the affected areas. Laws regulating blockchain will improve its chance at success, not undermine it.<sup>15</sup>

This paper describes and evaluates the current and potential uses of blockchain technology in intellectual property law. Section I explains what blockchain technology is and its place in the world of law. Section II defines intellectual property rights. Section III discusses existing and potential uses of blockchain technology in relation to intellectual property rights and evaluates their potential advantages and disadvantages. Finally, section IV

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9. See C. Daniel Lockaby, Note, *The SEC Rides into Town: Defining an ICO Securities Safe Harbor in the Cryptocurrency “Wild West”*, 53 GA. L. REV. 335, 337 (2018).

10. AGASHE, DETROJA & MEHTA, *supra* note 6, at 56–57. See generally, *Communication from the Commission to the European Parliament and the Council on an Action Plan for Strengthening the Fight Against Terrorist Financing*, COM (2016) 50 final (Feb. 2, 2016).

11. Werbach, *supra* note 8, at 496–97.

12. HANNA SAMIR KASSAB, *PRIORITIZATION THEORY AND DEFENSIVE FOREIGN POLICY: SYSTEMIC VULNERABILITIES IN INTERNATIONAL POLITICS* 164–67 (Palgrave Macmillan 2019).

13. Council Directive 2018/843, 2018 O.J. (L 156) 43, 48 (EU). On May 30th, 2018 the Council of the EU adopted The Fifth Anti-Money Laundering Directing, but the passage and transposition of this directive are only first steps in developing a comprehensive and meaningful EU-wide regulatory framework. *Id.*

14. Omri Marian, *Blockchain Havens and the Need for Their Internationally-Coordinated Regulation* 20 N.C. J.L. & TECH. 529, 535, 562 (2019).

15. Werbach, *supra* note 8, at 528–29. Note, this introduction and paper draws from the author’s previous work, a look at blockchain and international dispute resolutions. Seda Fabian, *International Civil Dispute Resolution: Blockchain & Law* (Dec. 2019) (unpublished manuscript) (on file with author). For a copy of the work, please request it from the author.

concludes by summarizing this gained knowledge and providing a call to action to regulate blockchain technology properly.

## I. BLOCKCHAIN TECHNOLOGY

De Filippi and Wright wrote,

“[[b]lockchains are, in many ways, the ‘tamper-proof boxes’ envisioned by May nearly thirty years ago. They blend together several existing technologies, including peer-to-peer networks, public-private key cryptography, and consensus mechanisms, to create what can be thought of as a highly resilient and tamper-resistant database where people can store data in a transparent and non-repudiable manner and engage in a variety of economic transactions pseudonymously.”<sup>16</sup>

Blockchain is a decentralized and transparent ledger that records transactions between parties.<sup>17</sup> Blocks of data are bound to each other in a chain, and each blockchain is encrypted.<sup>18</sup> The validity of each new transaction is confirmed within the network, and added to the chain only after the transaction is verified within the network, thus there is no central authority.<sup>19</sup> Once added to the blockchain, the record is, somewhat problematically, claimed to be immutable<sup>20</sup>—it becomes permanent.<sup>21</sup> Any attempt to tamper with the data would lead to a reaction which would unpredictably affect the whole chain.<sup>22</sup> This makes changing records difficult,<sup>23</sup> which, together with the fact that no middleman is needed to verify the authenticity of the data,<sup>24</sup> makes blockchain self-monitored, and thus unique for users seeking to record data. This latter feature is considered one of the essential elements for the purposes of protection of any IPR, as will be explained.<sup>25</sup>

Blockchains are pseudonymous.<sup>26</sup> Each block has a unique fingerprint, called a “hash.”<sup>27</sup> Hashes are generated by hash functions, which only work one-way, taking any input and producing an output that is almost untraceable

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16. DE FILIPPI & WRIGHT, *supra* note 3.

17. Luke Conway, *Blockchain Explained*, INVESTOPEDIA (Nov. 14, 2020), <https://www.investopedia.com/terms/b/blockchain.asp> [<https://perma.cc/EA9D-5M7W>].

18. AARON WRIGHT & PRIMAVERA DE FILIPPI, *DECENTRALIZED BLOCKCHAIN TECHNOLOGY AND THE RISE OF LEX CRYPTOGRAPHIA* 6 (2015).

19. *Blockchain*, EUROPEAN UNION AGENCY FOR CYBERSECURITY, <https://www.enisa.europa.eu/topics/csirts-in-europe/glossary/blockchain> [<https://perma.cc/PB5F-4PHR>].

20. Angela Walch, *The Path of the Blockchain Lexicon (and the Law)*, 36 *REV. BANKING & FIN. L.* 713, 742 (2017).

21. *DECENTRALIZED BLOCKCHAIN TECHNOLOGY*, *supra* note 18, at 8.

22. DE FILIPPI & WRIGHT, *supra* note 3, at 23–25.

23. This is, of course, a subject of many debates. See Serita Thapa, Papri Ghosh & Bijoy Chhetri, *Security Issues on Blockchain Network (BeN): A Review*, 2nd Int’l Conf. on Advances in Sci. & Tech. (ICAST) 2 (2019).

24. *DECENTRALIZED BLOCKCHAIN TECHNOLOGY*, *supra* note 18, at 2, 23.

25. Gönenç Gürkaynak et al., *Intellectual Property Law and Practice in the Blockchain Realm*, 34 *COMPUT. L. & SEC. REV.* 847, 856 (2018).

26. DE FILIPPI & WRIGHT, *supra* note 3, at 38.

27. Antony Lewis, *A Gentle Introduction to Blockchain Technology*, BITS ON BLOCKS (Sept. 9, 2015), <https://bitsonblocks.net/2015/09/09/gentle-introduction-blockchain-technology/> [<https://perma.cc/UQ8F-6CZ5>].

to its origin.<sup>28</sup> Hash contains all transactions contained in the block presented as a series of characters and numbers,<sup>29</sup> thus protecting the data from what other users see on a transparent ledger.<sup>30</sup> As such, hash functions are supposedly noninvertible; the input cannot be traced simply by having access to the output number.<sup>31</sup>

#### A. SMART CONTRACTS

Smart contracts based on blockchain technology are able to enforce obligations automatically<sup>32</sup> through code.<sup>33</sup> In IP law, they may, for example, serve to automate payments of royalties.<sup>34</sup> Moreover, smart contracts may be used for almost any transaction. They are often considered one of the most crucial developments of blockchain.<sup>35</sup> However, as with blockchain technology itself, smart contracts based on blockchain technology have their downsides. For example, even if the parties wanted to postpone the execution of the contract, once the conditions are fulfilled, the execution of the contract cannot be stopped.<sup>36</sup> While liability enforcement for a breach of contract currently occurs after the breach, smart contracts create a “zero tolerance policy” once codified conditions are met.<sup>37</sup> Given the nature of contract law and principles such as freedom of contract, this may be considered a vital issue that is yet to be resolved as, for example, parties do not have much freedom to amend or modify their contract once the conditions for the enforcement are met.<sup>38</sup>

#### B. PRACTICAL USE

Even though Bitcoin and Ethereum are what most people think of when they hear the term “blockchain,” the potential of this innovative technology is much more diverse and likely to continue to expand in the future. In fact, the applications of blockchain are virtually unlimited. For instance, a pure version of blockchain may be used for crowdfunding, as a database, as a supply chain or for land title registration, stock trading, or identity

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28. Joseph Chow, *Blockchain Underpinnings: Hashing*, MEDIUM: CONSENSYS (Jan. 13, 2016), <https://medium.com/@ConsenSys/blockchain-underpin-nings-hashing-7f4746cbd66b> [<https://perma.cc/9hs3-3mkb>].

29. DE FILIPPI & WRIGHT, *supra* note 3, at 22–23.

30. ALAN T. NORMAN, *BLOCKCHAIN TECHNOLOGY EXPLAINED: THE ULTIMATE BEGINNERS GUIDE ABOUT BLOCKCHAIN WALLET, MINING, BITCOIN, ETHEREUM, LITECOIN, ZCASH, MONERO, RIPPLE, DASH, IOTA AND SMART CONTRACTS* 20 (2017).

31. See DANIEL DRESCHER, *BLOCKCHAIN BASICS: A NON-TECHNICAL INTRODUCTION IN 25 STEPS* 71–73 (2017).

32. Lin William Cong & Zhiguo He, *Blockchain Disruption and Smart Contracts*, 32 REV. FIN. STUD. 1754, 1762 (2019).

33. DE FILIPPI & WRIGHT, *supra* note 3, at 74–75.

34. Gürkaynak et al., *supra* note 25, at 854.

35. DRESCHER, *supra* note 31, at 241.

36. DE FILIPPI & WRIGHT, *supra* note 3, at 74–75.

37. *DECENTRALIZED BLOCKCHAIN TECHNOLOGY*, *supra* note 18, at 25–26.

38. Max Raskin, *The Law and Legality of Smart Contracts*, 1 GEO. L. TECH. REV. 304, 326–27 (2017).

management.<sup>39</sup> The following section will discuss one of the potential uses: blockchain in relation to IPRs.

## II. INTELLECTUAL PROPERTY RIGHTS

This section will very briefly introduce each type of IPR as background information for readers unfamiliar with U.S. IPRs. The following section will then discuss how blockchain relates to, and may be used within, the framework of each type of IPR.

### A. PATENT

Congress has the power to enact laws relating to patents.<sup>40</sup> Patent laws are codified in Title 35 of the U.S. Code.<sup>41</sup> The law also established the United States Patent and Trademark Office (“USPTO”), which holds the sole power to issue patents.<sup>42</sup> Patents are a form of IP that protects inventions with the purpose of motivating inventors to invest in developing new ideas.<sup>43</sup> A patent allows its owner to “exclude others from making, using, offering for sale, or selling an invention in the United States or importing the invention into the United States.”<sup>44</sup> This power to exclude lasts for a limited amount of time; in the United States, utility patents are protected for twenty years from the date the application was filed.<sup>45</sup>

Though not everything is patentable, the language of the statute provides that any person who “invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent.”<sup>46</sup> The “cost” for this strong protection, which the patent provides, is not only the fee but also the fact that the protection is not indefinite, and the invention must be published.<sup>47</sup> Yet, a twenty-year monopoly and the system of protection seem to justify the publication requirement for many inventors.<sup>48</sup> Unsurprisingly,

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39. Ameer Rosic, *What Is Blockchain Technology? A Step-by-Step Guide for Beginners*, BLOCKGEEKS, <https://blockgeeks.com/guides/what-is-blockchain-technology/> [https://perma.cc/58ZL-323Z].

40. U.S. CONST. art. I, § 8.

41. 35 U.S.C. (2019).

42. *General Information Concerning Patents*, U.S. PATENT & TRADEMARK OFF., <https://www.uspto.gov/patents-getting-started/general-information-concerning-patents#heading-4> [https://perma.cc/7X3K-6SCC].

43. 1 PETER S. MENELL, MARK A. LEMLEY, & ROBERT P. MERGES., *INTELLECTUAL PROPERTY IN THE NEW TECHNOLOGICAL AGE: PERSPECTIVES, TRADE SECRETS & PATENTS* 167 (2017).

44. *General Information Concerning Patents*, *supra* note 42.

45. 35 U.S.C. § 154 (2020).

46. 35 U.S.C. § 101.

47. SmithAmundsen LLC, *The Purpose Behind Patent Law and What It Means for You*, JD Supra (Feb. 20, 2017), <https://www.jdsupra.com/legalnews/the-purpose-behind-patent-law-and-what-92379/> [https://perma.cc/67C7-WDZV].

48. Alan Devlin, *The Misunderstood Function of Disclosure in Patent Law*, 23 HARV. J.L. & TECH. 401, 418–25 (2010).

there is a debate in the legal community concerning how to find a balance between these disadvantages and advantages.<sup>49</sup>

#### B. COPYRIGHT

The basis of copyright law in the United States is the Copyright Clause of the Constitution.<sup>50</sup> The general framework is provided by the Copyright Act of 1976 that is codified in Title 17 of the U.S. Code.<sup>51</sup>

There are eight protected categories that are listed in §102, namely: “(1) literary works; (2) musical works, including any accompanying words; (3) dramatic works, including any accompanying music; (4) pantomimes and choreographic works; (5) pictorial, graphic, and sculptural works; (6) motion pictures and other audiovisual works; (7) sound recordings; and (8) architectural works.”<sup>52</sup> This list is, however, not exhaustive; therefore, courts have discretion as to what will be protected and what the scope of those categories is.<sup>53</sup>

All original works of authorship are protected from the moment they are created and fixed in a tangible form.<sup>54</sup> Unlike patents or trademarks, works do not need to be registered for a copyright to be created.<sup>55</sup> However, registration is recommended, as explained later.<sup>56</sup> There are also categories excluded from copyright protection: facts, ideas, systems, or methods of operation.<sup>57</sup>

Another statute worth mentioning in this context is the Digital Millennium Copyright Act, which addresses the correlation between copyright and the Internet.<sup>58</sup>

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49. Walter Frick, *Patents Are Eating the World and Hurting Innovation*, HARV. BUS. REV. (June 26, 2014), <https://hbr.org/2014/06/patents-are-eating-the-world-and-hurting-innovation> [https://perma.cc/S9XB-KRMP].

50. STEPHEN M. MCJOHN, *EXAMPLES & EXPLANATIONS: INTELLECTUAL PROPERTY* 15 (5th ed. 2015).

51. U.S. COPYRIGHT OFF., *COPYRIGHT LAW OF THE UNITED STATES (TITLE 17)* (June 2020), <https://www.copyright.gov/title17/> [https://perma.cc/6MZE-RV77].

52. 17 U.S.C. § 102.

53. 2 MARK A. LEMLEY, PETER S. MENELL & ROBERT P. MERGES, *INTELLECTUAL PROPERTY IN THE NEW TECHNOLOGICAL AGE*: 2018, 528 (2018).

54. 17 U.S.C. § 102.

55. 2 LEMLEY, MENELL & MERGES, *supra* note 53, at 497.

56. *Copyright in General*, U.S. COPYRIGHT OFF., <https://www.copyright.gov/help/faq/faq-general.html> [https://perma.cc/2752-CTBQ].

57. *What Does Copyright Protect?*, U.S. COPYRIGHT OFF., <https://www.copyright.gov/help/faq/faq-protect.html> [https://perma.cc/YY27-6YCM].

58. *The Digital Millennium Copyright Act*, U.S. COPYRIGHT OFF., <https://www.copyright.gov/dmca/> [https://perma.cc/8LBJ-VYW5].

## C. TRADEMARK

“A trademark is a word, phrase, symbol, and/or design that identifies and distinguishes the source of the goods of one party from those of others.”<sup>59</sup>

Trademarks have likely followed the existence of trade itself.<sup>60</sup> Trademark law, however, was, on the state level, developed relatively recently, in the nineteenth century.<sup>61</sup> The purpose of trademark law is to provide protection for both consumers and sellers; trademarks protect the identity of a business, minimize the need to verify the origins of a product, and further consumer confidence in assuring that what consumers are buying is what they meant to buy.<sup>62</sup>

Trademark law in the United States is, on the federal level, governed primarily by the Lanham Act, enacted in 1946, which governs the registration of national trademarks.<sup>63</sup> However, each U.S. state also has its own trademark registration system<sup>64</sup> that may be used for marks not intended for national use.

## D. TRADE SECRET

A trade secret includes a broad category of information that can be protected. This information may be in the form of a “formula, pattern, compilation, program, device, method, technique, or process.”<sup>65</sup> Trade secrets may be chemical processes, marketing strategies, lists of clients, and more.<sup>66</sup> Probably the most well-known, though still closely guarded, trade secret is Coca-Cola’s recipe, created in 1886.<sup>67</sup>

Trade secrets are protected without any need for registration,<sup>68</sup> but there are elements that must be met for trade secrets to remain legally protected.<sup>69</sup> The information must: be secret, have commercial value, and be the subject

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59. *Trademark, Patent, or Copyright?*, U.S. PATENT & TRADEMARK OFF. (Jan. 17, 2021, 12:12 P.M.), <https://www.uspto.gov/trademarks-getting-started/trademark-basics/trademark-patent-or-copyright> [https://perma.cc/FVC7-J3H6].

60. LEMLEY, MENELL & MERGES, *supra* note 53, at 861.

61. Zvi S. Rosen, *Federal Trademark Law: From Its Beginnings*, A.B.A. (Apr. 2019), [https://www.americanbar.org/groups/intellectual\\_property\\_law/publications/landslide/2018-19/march-april/federal-trademark-law/](https://www.americanbar.org/groups/intellectual_property_law/publications/landslide/2018-19/march-april/federal-trademark-law/) [https://perma.cc/E3DG-7BBC].

62. Michael Grynberg, *Trademark Litigation as Consumer Conflict*, 83 N.Y.U. L. REV. 61, 64–65 (2018).

63. LEMLEY, MENELL & MERGES, *supra* note 53, at 862.

64. *State Trademark Information Links*, U.S. Patent & Trademark Off. (Nov. 10, 2020, 2:11 PM), <https://www.uspto.gov/trademarks-getting-started/process-overview/state-trademark-information-links> [https://perma.cc/CXB8-8HF7].

65. UNIF. TRADE SECRETS ACT § 1 (UNIF. L. COMM’N. 1985).

66. MCJOHN, *supra* note 50, at 481.

67. Orly Lobel, *Filing for a Patent Versus Keeping Your Invention a Trade Secret*, HARV. BUS. REV. (Nov. 21, 2013), <https://hbr.org/2013/11/filing-for-a-patent-versus-keeping-your-invention-a-trade-secret> [https://perma.cc/D55K-56ZG].

68. *Frequently Asked Questions: Trade Secrets*, WORLD INTELL. PROP. ORG., [https://www.wipo.int/trademarks/en/trademarks\\_faqs.html](https://www.wipo.int/trademarks/en/trademarks_faqs.html) [https://perma.cc/DJ6S-9QNU].

69. 1 LEMLEY, MENELL & MERGES, *supra* note 43, at 49.

of reasonable efforts to keep the information secret.<sup>70</sup> Their protection, like a trademark, is potentially indefinite.<sup>71</sup>

The Uniform Trade Secrets Act, which most U.S. states have adopted,<sup>72</sup> protects against “theft, bribery, misrepresentation, breach or inducement of breach of a duty to maintain secrecy, or espionage through electronic or other means.”<sup>73</sup> At the federal level, trade secrets are governed by the Defend Trade Secrets Act of 2016.<sup>74</sup>

### III. POTENTIAL USES OF BLOCKCHAIN TECHNOLOGY IN INTELLECTUAL PROPERTY LAW

There are many ways in which blockchain may affect IP law. In fact, in areas such as digital rights management, it already does.<sup>75</sup> As a secured distributed ledger, blockchain offers many opportunities to store and protect any kind of data, but there are some aspects unique to IP. Indeed, blockchain provides solutions to problems that the IP industry has searched for throughout its history, including a means of protecting and collecting data and enforcing contracts. Below, each IPR is discussed in relation to potential uses of blockchain technology.

#### A. PATENT AND BLOCKCHAIN

Blockchain may, in several ways, improve the current patent system. Currently, in the United States, the power to examine and publish inventions belongs to the USPTO.<sup>76</sup> This office is the “center” of the patent system, and thus it is overwhelmed by a tremendous amount of work and responsibility, so much so that patent quality may decrease.<sup>77</sup> As a result, many initiatives have been undertaken to resolve issues associated with low-quality patents.<sup>78</sup> These efforts have spawned many innovations; artificial intelligence is often mentioned as one potential means of reducing the administrative burden placed on the USPTO.<sup>79</sup>

70. *Frequently Asked Questions: Trade Secrets*, *supra* note 68.

71. *Id.*

72. 1 LEMLEY, MENELL & MERGES, *supra* note 43, at 47.

73. UNIF. TRADE SECRETS ACT § 1 (UNIF. L. COMM’N. 1985).

74. 1 LEMLEY, MENELL & MERGES, *supra* note 43, at 48.

75. Flore Brunetti, *DRM and Blockchain: A Solution to Protect Copyrights in the Digital World?*, N.Y.U.: BLOG (Jan. 2, 2019), <https://blog.jipel.law.nyu.edu/2019/01/drm-and-blockchain-a-solution-to-protect-copyrights-in-the-digital-world/> [<https://perma.cc/FC4C-U927>].

76. *General Information Concerning Patents*, *supra* note 42.

77. Dugie Standeford, *Despite Ongoing Efforts, USPTO Still Faces Patent Quality Issues*, INTELL. PROP. WATCH (Sept. 16, 2016), <http://www.ip-watch.org/2016/09/16/despite-ongoing-efforts-uspto-still-faces-patent-quality-issues/> [<https://perma.cc/269N-S3ZA>].

78. Brian J. Love, Shawn P. Miller & Shawn Ambwani, *Determinants of Patent Quality: Evidence from Inter Partes Review Proceedings*, 90 UNIV. COLO. L. REV. 67 (2019).

79. Subcomm. on Intell. Prop., *Promoting the Useful Arts: How can Congress Prevent the Issuance of Poor Quality Patents?*, SENATE COMM. ON JUDICIARY (Oct. 30, 2019, 2:00 P.M.), <https://www.judiciary.senate.gov/meetings/promoting-the-useful-arts-how-can-congress-prevent-the->



One of the most revolutionary proposed potential blockchain uses is the creation of a decentralized patent system wherein inventors would submit their applications to a shared patent record, and not to the USPTO, thus massively decreasing the administrative burden that now lays on the USPTO; the shared record would then be opened to the public after a certain amount of time.<sup>80</sup> Such a system would speed up the patent application and examination processes thanks to de-bureaucratization while potentially improving the quality of patents because parties themselves would bear some tasks that are currently in the hands of USPTO officers.<sup>81</sup> This decentralization, increased transparency, and distribution of information could also lead to an international patent database.<sup>82</sup>

IPwe's Global Patent Registry offers another intriguing solution.<sup>83</sup> IPwe is a secure, open blockchain registry of the world's patents with the aim of transforming the patent ecosystem by reducing frictions within it.<sup>84</sup> In the future, IPwe anticipates working with patent offices and enabling some functions, such as the payment of maintenance fees.<sup>85</sup>

Not all innovations would displace the USPTO, though. Some have proposed the use of blockchain technology within the USPTO. For example, blockchain could be used to help the USPTO fight counterfeit patents.<sup>86</sup> Additionally, as the United States follows the "first-to-file system," the patent application filing date is crucial.<sup>87</sup> Here, the above-mentioned blockchain time-stamp could be used as proof of the date when the one-year grace period started.<sup>88</sup> Indeed, blockchain could significantly reduce administrative tasks and the number of transactions needed to maintain the patent system.<sup>89</sup>

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issuance-of-poor-quality-patents?fbclid=IwAR1neNswUdJwoUvtBu\_DZ9hN\_egjodygKUIMv0xOos6dizcg98IOEQiV5k [https://perma.cc/BF6V-Z6KE].

80. Lital Helman, *Decentralized Patent System*, 20 NEV. L.J. 67 (2019).

81. *Id.*

82. Gaétan de Rassenfosse & Kyle Higham, *Decentralising the Patent System*, GOV'T INFO. Q. 2–6 (2021). *See also id.* at 29–39.

83. IPWE, THE WORLD'S FIRST GLOBAL PATENT MARKET (2020), <https://aboutipwe.com/wp-content/uploads/2018/12/IPwe-Corporate-Presentation.pdf> [https://perma.cc/Z6QG-5743].

84. IPWE, <https://ipwe.com/> [https://perma.cc/Z69S-QFSM].

85. IPWE, THE PLATFORM FOR THE WORLD'S PATENT ECOSYSTEM, (2020), [https://www.wipo.int/edocs/mdocs/classifications/en/wipo\\_ip\\_cws\\_bc\\_ge\\_19/wipo\\_ip\\_cws\\_bc\\_session\\_5\\_spangenberg.pdf](https://www.wipo.int/edocs/mdocs/classifications/en/wipo_ip_cws_bc_ge_19/wipo_ip_cws_bc_session_5_spangenberg.pdf) [https://perma.cc/MFG6-8QWW].

86. Katarina Gonzalez, *Permissioned Blockchains & Smart Contracts: The Smarter Way to Protect Intellectual Property*, RUTGERS U.L. REV. COMMENTARIES 38, 49–50 (2020).

87. Jill A. Jacobson et al., FisherBroyles LLP, *Timing Your Patent Filing: The Pros and Cons of Filing Early and Quickly*, LEXOLOGY (Dec. 19, 2017), <https://www.lexology.com/library/detail.aspx?g=61d1b8a5-3453-4079-8980-598c8e64c526> [https://perma.cc/Q3AS-2RCN].

88. Chinh H. Pham, Barbara A. Jones & Jonathan A. Beckham, Greenberg Traurig LLP, *Could Blockchain Disrupt How We Protect Our Intellectual Property?*, LEXOLOGY (2018), <https://www.lexology.com/library/detail.aspx?g=edefa75-b081-4392-98aa-04ae8f893543> [https://perma.cc/K998-ANN5].

89. *Id.*

Other ways to use blockchain are blockchain-based smart contracts and automated licensing, which improve the commercialization process and simplify the business process for inventors.<sup>90</sup>

#### B. COPYRIGHT AND BLOCKCHAIN

Throughout the history of IPRs, governments have required authors to meet various formalities to protect their works.<sup>91</sup> However, unlike as with patents or trademarks, copyright protection in the United States currently exists automatically once the original work of authorship is fixed in a tangible medium.<sup>92</sup> Mandatory registration would be illegal<sup>93</sup> and violate Article 5 of the Berne Convention,<sup>94</sup> as well as its incorporation into The Agreement on Trade-Related Aspects of Intellectual Property Rights (“TRIPS”),<sup>95</sup> and the World Intellectual Property Organization (“WIPO”) Copyright Treaty.<sup>96</sup> “[T]hese requirements clash with a characterization of copyright springing from the creative act. If copyright is born with the work, then no further state action should be necessary to confer the right; the sole relevant act is the work’s creation.”<sup>97</sup>

To join the Berne Convention, the United States abandoned its own formalities, such as a mandatory copyright notice.<sup>98</sup> Simplifying the process of protection for authors, however, brought another issue: proving the date of creation. Specifically, how can such a date be proven if there is no formal registration? One solution is that authors are often encouraged to include the copyright notice on the work,<sup>99</sup> which consists of a copyright symbol, the year of first publication, and the name of the owner of the copyright.<sup>100</sup> Others mail a copy of the work to themselves and keep the unsealed envelope in case of any dispute in the future, which is sometimes called a “poor man’s

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90. Helman, *supra* note 80, at 98–102.

91. Christopher Sprigman, *Reform(al)izing Copyright*, 57 STAN. L. REV. 485, 491–94 (2004).

92. U.S. COPYRIGHT OFF., COPYRIGHT BASICS 4 (2019), <https://www.copyright.gov/circs/circ01.pdf> [<https://perma.cc/45D3-Q2HK>].

93. Jake Goldenfein & Dan Hunter, *Blockchains, Orphan Works, and the Public Domain*, 41 COLUM. J.L. & ARTS 1, 2–3 (2017).

94. Berne Convention for the Protection of Literary and Artistic Works art. 5, ¶ 2, Sept. 9, 1886, 828 U.N.T.S. 221.

95. Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, art. 9, ¶ 1, Apr. 15, 1994, 1869 U.N.T.S. 3, [https://www.wto.org/english/docs\\_e/legal\\_e/27-trips\\_04\\_e.htm](https://www.wto.org/english/docs_e/legal_e/27-trips_04_e.htm) [<https://perma.cc/6WXH-BL5Z>].

96. WIPO Copyright Treaty art. 1, ¶ 4, Dec. 20, 1996, S. Treaty Doc. No. 105-17, 36 I.L.M. 65, <https://wipo.int/en/text/295157> [<https://perma.cc/65CJ-NGKB>].

97. Jane C. Ginsburg, *A Tale of Two Copyrights: Literary Property in Revolutionary France and America*, 64 TUL. L. REV. 991, 994 (1990).

98. David R. Carducci, Note, *Copyright Registration: Why the U.S. Should Berne the Registration Requirement*, 36 GA. ST. UNIV. L. REV. 873, 900–01 (2020).

99. Rich Stim, *Copyright Protection: What It Is, How It Works*, STAN. COPYRIGHT & FAIR USE (Oct. 2016), <https://fairuse.stanford.edu/overview/faqs/copyright-protection> [<https://perma.cc/8EEF-EAGJ>].

100. *Definitions*, U.S. COPYRIGHT OFF., <https://www.copyright.gov/help/faq/faq-definitions.html> [<https://perma.cc/38UB-B75E>].

copyright.”<sup>101</sup> However, the United States Copyright Office explicitly states that a “poor man’s copyright” is not a method recognized by copyright law to formalize the date of creation.<sup>102</sup> Furthermore, before any copyright infringement lawsuit may be filed in court, the creator must register their right with the United States Copyright Office.<sup>103</sup> Once the copyright application is examined and approved, the author will receive a certificate of registration.<sup>104</sup> This certificate then allows the creator to sue those copying or wrongfully using the work.<sup>105</sup>

Therefore, for now, those who wish to protect their work often have to introduce the copyright registration evidence even though it is not required for the creation of the right. There is also another reason why such registration is often sought: it creates a legal presumption of ownership if registration occurs within five years of publication; thus, prima facie proof of ownership exists in the case of a lawsuit.<sup>106</sup> The irony of this necessity to register one’s works to enforce rights, yet illegality of mandatory registry by virtue of the Berne Convention, can hardly be solved by blockchain.

Blockchain may, however, similarly to what is described above, simplify the registration process by providing a time-stamp on each copyrighted work. Additionally, blockchain technology might also solve the lack of transparency in, and limit the ability of, online platforms that serve as copyright information intermediaries to unilaterally change rules or policies of platform use.<sup>107</sup> Any user could register their work on blockchain, thereby creating tamper-proof evidence of possession at the time of recording that could even include specifics, such as percentages of ownership.<sup>108</sup> Such a hashed and time-stamped record would also help with common copyright issues, such as proof of the time of creation or recording the real-time transactions (tracking copyrights, and their licenses and assignments).<sup>109</sup> Being able to record their copyright would not put authors at risk; to the contrary, it could protect even masked authors by providing a kind of digital identity that maintains author privacy while protecting their works.<sup>110</sup>

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101. Sarah Anderson, Note, *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, 24–25 (2018).

102. *Copyright in General*, *supra* note 56.

103. *Id.*

104. COPYRIGHT BASICS, *supra* note 92, at 7.

105. *Id.*

106. *Copyright in General*, *supra* note 56.

107. Alexander Savelyev, Copyright in the Blockchain Era: Promises and Challenges 8–9 (Nat’l Res. Univ. Higher Sch. Econ., Working Paper No. 77, 2017), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3075246](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3075246) [<https://perma.cc/M9EK-9Z89>].

108. Annabel Tresise, Jake Goldenfein & Dan Hunter, *What Blockchain Can and Can’t Do for Copyright*, 28 AUSTRAL. INTEL. PROP. J. 144, 143–49 (2018).

109. Goldenfein & Hunter, *supra* note 93, at 12.

110. Tom W. Bell, *Copyrights, Privacy, and the Blockchain*, 42 OHIO N. UNIV. L. REV. 439, 463–65 (2016).

Another issue the blockchain may potentially resolve is one surrounding orphan works and the public domain. Since orphan works are “locked away,” protected by copyright law, their use, and access to them, are limited.<sup>111</sup> Here, blockchain could help through its capacity to create a decentralized blockchain-based registry system.<sup>112</sup> Moreover, blockchain could reduce the number of future orphan works by making it much harder to disconnect authors from their works.<sup>113</sup>

There is another potential use for the blockchain—smart contracts. Among their many possible uses, smart contracts can facilitate the licensing of copyrights. As smart contracts do not require human intervention to execute,<sup>114</sup> rights under such contracts could be enforced automatically, which means saving costs and minimizing interpretive variability.<sup>115</sup> A smart contract could distribute rights in near real-time, making collective management organizations and their role as intermediaries potentially superfluous.<sup>116</sup>

An important drawback is that—not everything put online is true, but once it is on the blockchain, it will be hard to prove any falsities. The information in a blockchain can be false; blockchain cannot itself verify the trustworthiness of facts as the inputs would necessarily originate “off-chain.”<sup>117</sup> Relatedly, data placed onto a blockchain incorrectly is not easily altered, if at all.<sup>118</sup>

### C. TRADEMARK AND BLOCKCHAIN

Blockchain could also add a great deal of value to trademark law. Blockchain could prove the registration or use of a trademark, handle applications and disputes, and combat counterfeiting by storing the relevant data, such as the identity of authentic goods throughout their distribution process, on the blockchain.<sup>119</sup> The protection of genuine trademarks could be strengthened by tracking items with the mark all the way from the manufacturer, through customs, to the warehouse.<sup>120</sup>

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111. Goldenfein & Hunter, *supra* note 93, at 14–15.

112. *Id.* at 22–26.

113. Jack Browning, *Please, Sir, I Want Some More*, MEDIUM (Sept. 6, 2016), <https://medium.com/creativeblockchain/please-sir-i-want-some-more-how-blockchain-technology-could-help-solve-copyrights-orphan-works-180f7fe1cb68> [https://perma.cc/FEH6-GAL3].

114. DE FILIPPI & WRIGHT, *supra* note 18, at 10–11.

115. Michèle Finck & Valentina Moscon, *Copyright Law on Blockchains: Between New Forms of Rights Administration and Digital Rights Management 2.0*, 50 INT’L REV. INTELL. PROP. & COMPETITION L. 77, 92–93 (2019).

116. *Id.* at 101–102.

117. Savelyev, *supra* note 107, at 15.

118. Finck & Moscon, *supra* note 115, at 98.

119. Michael Bacina, *Trade Marks and Blockchain: Technology Update*, LEXOLOGY, <https://www.lexology.com/library/detail.aspx?g=3d394348-df9c-4143-a3a0-cf3d7a759839> [https://perma.cc/M7EV-L7P3].

120. Susan Kayser & Anna Raimer, *Blockchain Can Change Everything Even Trademark Transactions*, 11 LANDSLIDE 26, 28 (2018).

Blockchain technology could also keep a record of prior uses of a trademark.<sup>121</sup> This way, blockchain could be used to prove abandonment of a trademark,<sup>122</sup> which causes the loss of the trademark rights.<sup>123</sup> “Since abandonment results in a forfeiture of rights, the courts are reluctant to find an abandonment . . . . The majority of courts have interpreted the ‘strictly proved’ rule to mean that evidence of the elements of abandonment must be clear and convincing.”<sup>124</sup> This then causes the “puzzling result that a trademark owner retains trademark rights even though it has ceased using the mark in the ordinary way and has no intent to resume use.”<sup>125</sup> Blockchain databases thus could provide proof of the use, or frequency of use, of the trademark.<sup>126</sup>

Another potential use of blockchain may be found in the fight against counterfeits. By tracking the supply chain, much more accurate authenticity checks of branded products could be achieved when the products are delivered to the final destination. Branded products could be authenticated by the database created by authorized manufacturers, distributors, and sellers, and, as such, blockchain could separate counterfeits from originals.<sup>127</sup>

#### D. TRADE SECRET AND BLOCKCHAIN

Based on the above information, the potential uses of blockchain for the security and enforcement of trade secrets is easy to extrapolate. If a business registers its trade secret within blockchain technology, it will be encrypted, not readable, and thus secured; therefore, the crucial aspect of all trade secrets—confidentiality—would be ensured.<sup>128</sup> The only information that would remain publicly available would be the hash and timestamp,<sup>129</sup> serving as proof that the data must have existed at a specific time, thus proving when a transaction occurred whilst not revealing any trade secret content.<sup>130</sup>

Moreover, blockchain could provide evidence of reasonable measures taken to protect such trade secrets, in case of any related dispute. The relevant preserved data would include who had access to the data, and when,

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121. CHINA IPR SME HELPDESK, GUIDE: IPR PROTECTION FOR AI TECHNOLOGY & APPLICATION OF BLOCKCHAIN IN CHINA 8 (2021), <https://www.china-iprhelpdesk.eu/sites/china-hd/files/public/Guide%20-%20IPR%20protection%20AI%20%26%20Blockchain%20-.pdf> [<https://perma.cc/7UKF-UFJF>].

122. Kayser & Raimer, *supra* note 120, at 28–29.

123. *Id.* at 28. See Lanham Trademark Act of 1946 § 45(2), 15 U.S.C. § 1127(2) (2020) (explaining that a mark can be abandoned either by intentional discontinuation of use or when the owner allows the mark to become generic).

124. THOMAS MCCARTHY, 3 MCCARTHY ON TRADEMARKS AND UNFAIR COMPETITION § 17:12 (5th ed. 2020).

125. Robert G. Bone, *Of Trolls, Orphans, and Abandoned Marks: What’s Wrong with Not Using Intellectual Property?*, 42 COLUM. J.L. & ARTS 1, 47 (2018).

126. Birgit Clark, *Blockchain and IP Law: A Match Made in Crypto Heaven?*, WIPO MAG., Feb. 2018, at 30.

127. Kayser & Raimer, *supra* note 120, at 30–31.

128. SINDRE DYRHOVDEN, BLOCKCHAIN AND TRADE SECRETS: A MATCH MADE IN HEAVEN? 10–11 (2020).

129. NAKAMOTO, *supra* note 2.

130. CHINA IPR SME HELPDESK, *supra* note 121.

thus providing an easier tool for proving misappropriation of the trade secrets.<sup>131</sup> Blockchain could track the misappropriation and find the “theft” because the chain leaves a trace of information at the moment of download.<sup>132</sup> The source of the improper download can then be used as evidence of theft.<sup>133</sup>

On the other hand, blockchain would likely not do a good job of providing proof of ownership of the trade secret because the blockchain ledger shows mere possession at the time the right is recorded, whereas; proving ownership may require other measures similar to those issues mentioned in the above section ‘Copyright and Blockchain.’<sup>134</sup> What is essential to trade secrets, though, are data integrity and confidentiality, which could be achieved on blockchain. As explained above, any information put on blockchain would be encrypted, and thus secure.<sup>135</sup>

Currently, WIPO is exploring potential uses of blockchain for the protection of trade secrets.<sup>136</sup> The suggestion is to use a blockchain database as proof that the information was, in fact, kept a secret if any misappropriation takes place, as mentioned above.<sup>137</sup> Another proposal is that blockchain could serve to share trade secrets securely with third parties without jeopardizing the secret itself.<sup>138</sup> WIPO, in its Report on the Blockchain Workshop, also mentions non-disclosure agreements, which are particularly well-suited to blockchains because blockchains prevent exposure of the protected information.<sup>139</sup> In fact, China has been considering the use of blockchain technology for securing trade secrets.<sup>140</sup>

## CONCLUSION

The demand for blockchain technology solutions for myriad IP challenges has increased enormously. Blockchain has the capacity to bring substantive improvements to a diverse array of issues, including privacy,<sup>141</sup>

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131. Birgit Clark & Ruth Burstall, *Crypto-Pie in the Sky? How Blockchain Technology Is Impacting Intellectual Property Law*, 2 STAN. J. BLOCKCHAIN L. & POL’Y 1, 10 (2019).

132. CHINA IPR SME HELPDESK, *supra* note 121, at 8.

133. *Id.*

134. Gino Chang & Wakako Inaba, *Is There a Trilemma Associated with Using Blockchain to Protect Trade Secrets?*, WINSTON & STRAWN LLP (Feb. 5th, 2019, 7:00 A.M.), <https://www.winston.com/en/thought-leadership/is-there-a-trilemma-associated-with-using-blockchain-to-protect-trade-secrets.html> [<https://perma.cc/44QW-926U>].

135. VAULTITUDE, HOW TO PROTECT IDEAS WITH BLOCKCHAIN TECHNOLOGY (2021), [<https://perma.cc/DWF2-R5J7>].

136. WORLD INTELL. PROP. ORG., REPORT ON THE BLOCKCHAIN WORKSHOP (2019), [https://www.wipo.int/edocs/mdocs/cws/en/cws\\_7/cws\\_7\\_item\\_7b.pdf](https://www.wipo.int/edocs/mdocs/cws/en/cws_7/cws_7_item_7b.pdf) [<https://perma.cc/RL5N-62C3>].

137. *Id.*

138. *Id.*

139. *Id.*

140. *China Considers Blockchain for Trade Secrets Protection*, LEDGER INSIGHTS (Jan. 14, 2020), <https://www.ledgerinsights.com/china-blockchain-trade-secrets-intellectual-property/> [<https://perma.cc/3M3Q-UT55>].

141. Primavera De Filippi, *The Interplay Between Decentralization and Privacy: The Case of Blockchain Technologies*, (7) J. PEER PROD., 14–16 (2016) (Fr.).

title registration, license databases, and even methods to pay royalties.<sup>142</sup> Blockchain may be able to register, track, distribute, or provide evidence of first use in commerce.<sup>143</sup> As for digital rights management, smart contracts may make it much easier for artists to collect their remuneration.<sup>144</sup> Indeed, given the sheer scope of potential uses and benefits, WIPO is exploring the potential for blockchain to protect IPRs on a global scale.<sup>145</sup> The proposition is indeed a revolutionary one, it suggests moving IPRs toward one global IP registry that would represent an “immutable record of events in the life of registered IP right[s].”<sup>146</sup>

As this paper makes clear, blockchain holds out the promise of combining transparency, immutability, and decentralization in ways that, in the near future, could protect innovators by securely storing intangible IPRs, establishing a comprehensive database of prior arts or copyrighted works, providing proof of authorship, authenticity, and sales, licensing, and providing encrypted evidence of the existence of trade secrets and their protections.

The combined effect of these improvements will be to speed the process of obtaining IPRs, lower costs, and increase security and transparency. As outlined above, blockchain may help in cases of IP law by allowing anything to be tracked, thereby fighting counterfeiting and minimizing administrative burden. However, without a prompt solution to the hurdles and obstacles that this novel technology brings, blockchain may end up being used as it was in 2013, in the Silk Road, by bad actors.<sup>147</sup> To avoid that, and to fully unlock all of its positive possibilities, we will need a comprehensive regulatory scheme, custom-tailored to the specifics that belong only to blockchain.

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142. Gürkaynak et al., *supra* note 25, at 854.

143. Clark & Burstall, *supra* note 131.

144. Finck & Moscon, *supra* note 115, at 102.

145. REPORT ON THE BLOCKCHAIN WORKSHOP, *supra* note 136.

146. *Id.*

147. KASSAB, *supra* note 12, at 164–67.