

THE ENIGMA OF DIGITIZED PROPERTY: A TRIBUTE TO JOHN PERRY BARLOW

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John Perry Barlow was a seer as well as a great songwriter. His provocative prose from *The Economy of Ideas*¹ speaks to us today as though it was written yesterday:

Throughout the time I've been groping around cyberspace, an immense, unsolved conundrum has remained at the root of nearly every legal, ethical, governmental, and social vexation to be found in the Virtual World. I refer to the problem of digitized property. The enigma is this: If our property can be infinitely reproduced and instantaneously distributed all over the planet without cost, without our knowledge, without its even leaving our possession, how can we protect it? How are we going to get paid for the work we do with our minds? And if we can't get paid, what will assure the continued creation and distribution of such work?²

Twenty-five years after WIRED's publication of Barlow's poetically prescient essay, the enigma of digitized property remains a serious concern to many creators. Recording artists loudly complain that the digital platforms that monetize their music are undercompensating them.³ Surveys of published authors report falling incomes from

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¹ John Perry Barlow, *The Economy of Ideas*, WIRED (Mar. 1, 1994), also available as *Selling Wine Without Bottles: The Economy of Mind on the Global Net*, 18 DUKE L. & TECH. REV. 8 (2019) (reprinted from ELEC. FRONTIER FOUND. (1993), <https://www.eff.org/pages/selling-wine-without-bottles-economy-mind-global-net> (earlier version)).

² Barlow, *supra* note 1, at 85, 18 DUKE L. & TECH. REV. at 8 ("The riddle is this"). Google Scholar reports that this essay has been cited in 580 publications, 278 of which were in law review articles.

³ See, e.g., Charlotte Hassan, *Reasons Why Some Artists Absolutely Hate Spotify*, DIGITAL MUSIC NEWS (Mar. 21, 2016), <https://www.digitalmusicnews.com/2016/03/21/why-artists-pull-their-music-from-spotify-but-not-youtube/>.

commercializing their creative work.⁴ Layoffs of news reporters at both conventional and digital newspapers are all too common.⁵ Peer-to-peer file sharing of movies and music continues to be remarkably prevalent,⁶ notwithstanding prodigious efforts by entertainment industry groups to curtail it through lawsuits and private enforcement arrangements with Internet access providers.⁷ Photographers report widespread infringements of their works on the Internet.⁸ Software “piracy” remains at least as rampant today as it was twenty-five years ago.⁹

Although Barlow predicted that copyright would not survive in the digital age,¹⁰ Part I explains that legislatures in the U.S. and EU have

⁴ See, e.g., *Six Takeaways from the Authors Guild 2018 Author Income Survey*, AUTHORS GUILD (Jan. 5, 2019), <https://www.authorsguild.org/industry-advocacy/six-takeaways-from-the-authors-guild-2018-authors-income-survey/>.

⁵ See, e.g., Elizabeth Grieco et al., *About a Third of Large U.S. Newspapers Have Suffered Layoffs Since 2017*, PEW RES. CTR. (July 23, 2018), <http://www.pewresearch.org/fact-tank/2018/07/23/about-a-third-of-large-u-s-newspapers-have-suffered-layoffs-since-2017/>.

⁶ See, e.g., *File Sharing*, TECXIPIO MAG., <https://www.tecxipio.com/statistics-file-sharing> (last accessed Mar. 27, 2019) (reporting that an average of 28 million Internet users per day engage in peer-to-peer file sharing).

⁷ See, e.g., Annemarie Bridy, *Graduated Response and the Turn to Private Ordering for Online Copyright Enforcement*, 89 ORE. L. REV. 81, 101 (2010).

⁸ See, e.g., *Copyright Alternative in Small-Claims Enforcement Act of 2017: Hearing on H.R. 3945 Before the H. Comm. on the Judiciary*, 115th Cong. (2018) (statement of David P. Trust), <https://uscopyrightreform.org/202018/09/29/house-judiciary-committee-hearing-the-case-act-2017/>.

⁹ Barlow, *supra* note 1, at 88, 18 DUKE L. & TECH. REV. at 14. For an example of recent estimates about software piracy, see Joseph Noonan, *2018 Revulytics Software Piracy Statistics and Thoughts on the BSA Global Software Survey*, REVULYTICS BLOG (June 7, 2018), <https://www.revulytics.com/blog/2018-revulytics-software-piracy-statistics> (estimating the commercial value of unlicensed software at \$46.3 billion).

¹⁰ John Perry Barlow, *The Next Economy of Ideas*, 8.10 WIRED 238, 242 (Oct. 2000), <https://www.wired.com/2000/10/download/>. A rich legal literature emerged in the 1990s and 2000s that resonates with Barlow’s skepticism about the future of copyright in the digital age and his celebration of free culture. See, e.g., KEITH AOKI, JAMES BOYLE, & JENNIFER JENKINS, *BOUND BY LAW: TALES FROM THE PUBLIC DOMAIN* (2006); JAMES BOYLE, *THE PUBLIC DOMAIN: ENCLOSING THE COMMONS OF THE MIND* (2008); *THE COMMODIFICATION OF INFORMATION* (Niva Elkin-Koren & Neil Weinstock Netanel eds., 2001); LAWRENCE LESSIG, *FREE CULTURE* (2004); LAWRENCE LESSIG, *THE FUTURE OF IDEAS: THE FATE OF THE COMMONS IN A CONNECTED WORLD* (2001); JESSICA D. LITMAN, *DIGITAL COPYRIGHT* (2000); SIVA VAIDYANATHAN, *COPYRIGHTS AND COPYWRONGS: THE RISE OF INTELLECTUAL PROPERTY AND HOW IT THREATENS CREATIVITY* (2001).

sought to address the enigma of digitized property by strengthening copyright rules and insisting that some previously unregulated uses must be licensed. That Part also discusses Barlow's cry for Internet freedoms, some of which have been echoed by commentators in the EU and U.S. in reaction to stricter copyright rules. Part II explores some ideas Barlow had about how the digitized property enigma might be addressed without tightening copyright rules. He had confidence that creative people would figure out ways to thrive in the economy of ideas. Part III provides evidence that the entertainment, book publishing, and other conventional copyright industries have indeed found ways to overcome the enigma of digitized property. New economies of creativity have emerged that Barlow would have celebrated.

I. LEGISLATIVE EFFORTS TO BOLSTER COPYRIGHT INDUSTRIES IN THE DIGITAL AGE

Legislatures in the U.S. and EU have responded to copyright owner claims about losses due to unauthorized online uses of their works by proposing or enacting new laws. A recent U.S. example is the Music Modernization Act (MMA) which established a revised framework for compulsory licensing of recorded music by online digital services such as Pandora.¹¹ The MMA also extended federal protection to sound recordings produced prior to 1972, which had previously been protected only by state laws.¹² Congress has also considered legislation to allow copyright owners to bring small claims to a review board in the Copyright Office to get compensation for online infringements that now go unremedied because of the high costs of litigation.¹³

¹¹ See Pub. L. No. 115-264, — Stat. — (2018), <https://www.congress.gov/bill/115th-congress/house-bill/1551/text>. For a discussion of how the MMA changed the regulation of sound recording copyright rules and licensing framework, see Tyler Ochoa, *An Analysis of Titles I and III of the Music Modernization Act, Part 2 of 2*, TECH. & MARKETING L. BLOG (Jan. 23, 2019), <https://blog.ericgoldman.org/archives/2019/01/an-analysis-of-title-i-and-title-iii-of-the-music-modernization-act-part-2-of-2-guest-blog-post.htm>.

¹² For an explanation of the part of the MMA that deals with pre-1972 recordings, see Tyler Ochoa, *An Analysis of Title II of Public Law 115-264: The Classics Protection and Access Act*, TECH. & MARKETING L. BLOG (Oct. 28, 2018), <https://blog.ericgoldman.org/archives/2018/10/an-analysis-of-title-ii-of-public-law-115-264-the-classics-protection-and-access-act-guest-blog-post.htm>.

¹³ Copyright Alternative in Small-Claims Enforcement (CASE) Act, H.R. 3945, 115th Cong. (2017). For a discussion of the main features of this Act, see generally Pamela Samuelson & Kathryn Hashimoto, *Scholarly Concerns About a Proposed Copyright Small Claims Tribunal*, 33 BERKELEY TECH. L.J. 689 (2018).

A far more ambitious and far-reaching initiative is the Council of the European Union’s proposed Directive on Copyright in the Digital Single Market (DSM).¹⁴ Article 11 of this Directive (sometimes known as the “link tax” provision) would create a new set of exclusive rights for EU press publishers to control online reproductions and distributions of more than a few words from the contents of their sites.¹⁵ Article 13 (sometimes known as the “upload filter” provision) would impose new obligations on Internet content sharing sites (such as YouTube) to block uploads of digital content unless the upload files were either licensed or otherwise known to be non-infringing.¹⁶ Failure to comply with this blocking obligation would result in the sites being directly liable for any user infringements.¹⁷ Article 13 represents a stark break from the “notice and takedown” rules adopted in the late 1990s that provided Internet service providers (ISPs) with a safe harbor from liability for user infringements of which they were unaware or unable to control.¹⁸ The main goal of these significant expansions of ISP liability rules is to give European content owners greater leverage to induce the content sharing

¹⁴ Council of the EU, *Proposal for a Directive of the European Parliament and of the Council on Copyright in the Digital Single Market—Outcome of Proceedings*, ST 6637 2019 INIT (Feb. 20, 2019) [hereinafter Proposed DSM Directive], <https://data.consilium.europa.eu/doc/document/ST-6637-2019-INIT/en/pdf>. As of this writing, the European Commission, Council, and Parliament completed a “trilogue” on a final text for this Directive, which the European Parliament approved in March 2019 and the EU Council adopted in April 2019. Article 11 is now Article 15; Article 13 is now Article 17. *See*, Carlton Daniel, *What to Make of the European Directive on Copyright in the Digital Single Market*, THE HILL (Apr. 25, 2019, 3:00 PM), <https://thehill.com/opinion/technology/440683-what-to-make-of-the-european-directive-on-copyright-in-the-digital-single>. The final step is for each member state of the EU to transpose the Directive into its national laws by 2021. *See* Eleanora Rosati, *BREAKING: Council Adopts DSM Directive*, IPKAT (Apr. 15, 2019), <http://ipkitten.blogspot.com/2019/04/breaking-council-adopts-dsm-directive.html>. Some parts of this article’s discussion of the DSM Directive are drawn from Pamela Samuelson, *Questioning a New Intellectual Property Right for Press Publishers*, 61 COMM. ACM 20 (Mar. 2019) and Pamela Samuelson, *The EU’s Controversial Digital Single Market Directive*, 60 COMM. ACM 20 (Nov. 2018).

¹⁵ Proposed DSM Directive, *supra* note 14, art. 11.

¹⁶ Proposed DSM Directive, *supra* note 14, art. 13.

¹⁷ *Id.*

¹⁸ Directive 2000/31/EC, of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market, art. 14, 2000 O.J. (L 178) 13; 17 U.S.C. § 512(c) (2012).

platforms to license EU digital contents or face large damage awards in court.¹⁹

Barlow would have been among the fiercest critics of these new liability rules had he lived just a little bit longer. As he wrote in *The Economy of Ideas*:

[W]hen the primary articles of commerce in a society look so much like speech as to be indistinguishable from it, and when the traditional methods of protecting their ownership have become ineffectual, attempting to fix the problem with broader and more vigorous enforcement will inevitably threaten freedom of speech. The greatest constraint on your future liberties may come not from government but from corporate legal departments laboring to protect by force what can no longer be protected by practical efficiency or general social consent.²⁰

Barlow back then believed that “digital technology [was] erasing the legal jurisdictions of the physical world and replacing them with the unbounded and perhaps permanently lawless waves of cyberspace.”²¹ But initiatives such as the DSM Directive vividly demonstrate that conventional copyright industries, their lobbyists, and governments that attend to these industries’ concerns are determined to make and enforce strict copyright rules that will tame the electronic frontier that Barlow so cherished and championed.

Barlow would have been heartened, though, by the many European scholars who have taken up the freedom of expression banner he waved so vigorously way back when. In April 2018, for example, a group of 169 IP academics sent a Statement to the EU Parliament

¹⁹ Articles 11 and 13 are not the only articles of the DSM Directive that aim to enhance licensing of EU creative contents and ensure that authors and other rights holders have more opportunities to receive compensation for their creations or databases. *See, e.g.*, Proposed DSM Directive, *supra* note 14, art. 7 (providing framework for licensing of out-of-commerce works); Proposed DSM Directive, *supra* note 14, arts. 14–16 (aiming to facilitate fair remuneration for authors and performers).

²⁰ Barlow, *supra* note 1, at 86, 18 DUKE L. & TECH. REV. at 11.

²¹ Barlow, *supra* note 1, at 86, 18 DUKE L. & TECH. REV. at 12 (“digital technology is also erasing the legal jurisdictions”). For a legal analysis that resonated with Barlow’s conception, see generally David R. Johnson and David G. Post, *Law and Borders—The Rise of Law in Cyberspace*, 48 STAN. L. REV. 1367 (1996) (suggesting that cyberspace should be regarded as its own jurisdiction).

strongly opposing Article 11.²² These academics believe that Article 11 would likely impede the free flow of news and other information vital to a democratic society, would harm journalists and others involved with news-related content, and would create uncertainty about the Article's coverage and scope.²³ Also unclear was how the new publisher right would interact with existing copyright laws, which typically allow for fair quotations, and database rights, which allow extractions of insubstantial parts of database contents.²⁴

Signatories of this Statement were also unpersuaded by the economic argument for Article 11.²⁵ A new press publisher right would considerably increase transaction costs as well as exacerbate existing power asymmetries in media markets. There was "no indication whatsoever that the proposed right will produce the positive results it is supposed to."²⁶ Moreover, "considering current high levels of market concentration on online advertising markets and in media, a publishers' right may well backfire: further strengthening the power of media conglomerates and of global platforms to the detriment of smaller players."²⁷

Another report on Article 11 observed that online journalists perceive the new right as a threat to the nature of news communication in

²² Marco Ricolfi, Raquel Xalabarder & Mirelle van Eechoud, *Academics Against Press Publishers' Right*, INST. FOR INFO. LAW (2018), <https://www.ivir.nl/academics-against-press-publishers-right/>. See also MAX PLANCK INST. FOR INNOVATION AND COMPETITION, *Position Statement on Proposed Modernisation of European Copyright Rules, Part E Protection of Press Publications Concerning Digital Uses*, https://www.ip.mpg.de/fileadmin/ipmpg/content/stellungnahmen/MPI_Position_Statement_PART_E_Publishers_2017_02_21_RMH_VM-def-1.pdf; Martin Kretschmer et al., *The European Commission's Public Consultation on the Role of Publishers in the Copyright Value Chain: A Response by the European Copyright Society*, 38 EUR. INTELL. PROP. REV. 591 (2016), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2801595.

²³ Ricolfi et al., *supra* note 22.

²⁴ Directive 2001/29/EC, of the European Parliament and of the Council of 22 May 2001 on the Harmonisation of Certain Aspects of Copyright and Related Rights in the Information Society, art. 5, 2001 O.J. (L. 167) 10, 16; Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the Legal Protection of Databases art. 8, 1996 O.J. (L. 77) 20, 26.

²⁵ Ricolfi et al., *supra* note 22.

²⁶ *Id.*

²⁷ *Id.*

the modern era: “Paying for links is as absurd as paying for citations in the academy would be.”²⁸

Even more dangerous for freedom of expression on the Internet is Article 13. Critics have argued that Article 13 would effectively mandate monitoring and filtering across all platforms, violating user privacy and free speech interests as automated systems would be obliged to scan all content and block even legitimate, noninfringing uses of copyrighted works such as quotations and parodies.²⁹ Article 13 also raises competition concerns, as it would likely favor and entrench major existing platforms, which already have or can afford to implement the necessary surveillance and filtering technologies, while disadvantaging smaller and newer entrants to the market.³⁰

Dozens of European intellectual property (IP) scholars have written articles criticizing the Article 13 filtering mandate on various grounds, including the threat it poses for freedom of expression on the Internet.³¹ Among the prominent critics of Article 13 is David Kaye, the United Nation’s Special Rapporteur for Freedom of Expression, who wrote a nine-page letter explaining why Article 13 is inconsistent with EU’s commitments under international human rights instruments.³² In

²⁸ LIONEL BENTLY ET AL., STRENGTHENING THE POSITION OF PRESS PUBLISHERS AND AUTHORS AND PERFORMERS IN THE COPYRIGHT DIRECTIVE: A STUDY COMMISSIONED BY THE EUROPEAN PARLIAMENT 34 (2017) (internal quotes omitted), http://www.europarl.europa.eu/RegData/etudes/STUD/2017/596810/IPOL_STU%282017%29596810_EN.pdf.

²⁹ See, e.g., Benjamin Austin, *Proposed EU Copyright Directive Poses Risks to Free Expression, Consumer Privacy, and Competition*, PUBLIC KNOWLEDGE (June 12, 2018), <https://www.publicknowledge.org/news-blog/blogs/proposed-eu-copyright-directive-poses-risks-to-free-expression-consumer-pri>.

³⁰ *Id.*

³¹ See *Article 13 Research: Studies, Opinions and Sources of Data*, CREATE (UK Copyright and Creative Economy Centre: Univ. of Glasgow), <https://www.create.ac.uk/policy-responses/eu-copyright-reform/article-13-research/> (listing critiques of Article 13); see, e.g., Martin Senftleben et al., *The Recommendation on Measures to Safeguard Fundamental Rights and the Open Internet in the Framework of the EU Copyright Reform*, 40 EUR. INTELL. PROP. REV. 149 (2018), <https://ssrn.com/abstract=3054967>.

³² David Kaye (Special Rapporteur), Mandate of the Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression, 7–8, U.N. Doc. OL OTH 41/2018 (June 13, 2018), <https://www.ohchr.org/Documents/Issues/Opinion/Legislation/OL-OTH-41-2018.pdf> (detailing specific concerns and concluding that “I am very seriously concerned that the proposed Directive would establish a regime of active monitoring and prior censorship of user-generated content that is inconsistent with Article 19(3) of the ICCPR.”).

addition, Tim Berners-Lee, Vint Cerf, and numerous other Internet pioneers signed an open letter urging the EU Parliament to drop Article 13:

By requiring Internet platforms to perform automatic filtering [on] all of the content that their users upload, Article 13 takes an unprecedented step towards the transformation of the Internet from an open platform for sharing and innovation, into a tool for the automated surveillance and control of its users.³³

More than 145 civil society organizations have expressed opposition to adoption of Article 13,³⁴ as have more than 5 million people who signed a petition against it.³⁵

Copyright industry lobbying groups, however, have succeeded in persuading EU policymakers to maintain and even strengthen the new rules that will impose strict infringement liability on websites that allow users to upload contents.³⁶ Whether Articles 11 and 13 will achieve the intended goal of boosting compensation to EU content providers from Internet platforms remains to be seen.

Google and Facebook are among the most obvious targets of these new regulations. While these firms may ultimately decide against licensing uses of EU contents,³⁷ at least they can afford to pay such fees

³³ Letter from Vint Cerf et al. to Antonio Tajani, President of the European Parliament (June 12, 2018), <https://www.eff.org/files/2018/06/12/article13letter.pdf>. See also Rhett Jones, *The Founding Fathers of the Internet Plead with EU to Squash Its Bad Copyright Bill*, GIZMODO (June 13, 2018, 11:57 AM), <https://gizmodo.com/the-founding-fathers-of-the-internet-plead-with-eu-to-s-1826792360>.

³⁴ See, e.g., Open Letter to Member of the European Parliament, <https://copybuzz.com/wp-content/uploads/2018/07/Copyright-Open-Letter-on-EP-Plenary-Vote-on-Negotiation-Mandate.pdf>. See also ASS'N FOR PROGRESSIVE COMM'CNS, *Call to Members of the European Parliament: Open Letter on the EU Copyright Reform* (July 2018), <https://www.apc.org/en/pubs/call-members-european-parliament-open-letter-eu-copyright-reform>.

³⁵ See, e.g., Foo Yun Chee, *EU Lawmakers to Vote on Copyright Overhaul Next Tuesday*, REUTERS (Mar. 21, 2019, 12:05 PM), <https://www.reuters.com/article/us-eu-copyright/eu-lawmakers-to-vote-on-copyright-overhaul-next-tuesday-idUSKCN1R228Z> (linking to the change.org online petition with more than 5 million signatures).

³⁶ Cory Doctorow, *The Final Version of the EU's Copyright Directive Is the Worst One Yet*, ELEC. FRONTIER FOUND. (Feb. 13, 2019), <https://www.eff.org/deeplinks/2019/02/final-version-eus-copyright-directive-worst-one-yet>.

³⁷ See, e.g., Matthew Karnitschnig & Chris Spillane, *Plan to Make Google Pay for News Hits Rocks*, POLITICO (Feb. 15, 2017, 7:36 PM), <https://www.politico.eu/article/plan-to-make-google-pay-for-news-hits-rocks->

if they decide that doing so is their best option. Smaller online services are likely to be much more constrained.

TechDirt, for example, a prominent site for online technology news and commentary, doubts that it can continue publishing in the EU:

Article 13 makes a commenting system untenable, as we simply cannot setup [sic] a filter that will block people from uploading copyright-covered content. Article 11 potentially makes our posts untenable, since we frequently quote other news sites in order to comment on them³⁸

TechDirt notes that the goal of those who support Articles 11 and 13

is not just to close the (made up, mythical) “value gap.” It is to fundamentally change the internet away from an open system of communications—one that anyone can use to **bypass** traditional gatekeepers, to a closed “broadcast” system, in which key legacy gatekeepers control access to the public, via a complicated set of licenses that strip all of the benefits and profits from the system.³⁹

TechDirt perceives Articles 11 and 13 to have serious negative implications for the general public as well as for individual creators:

Not only will [these new rules] do great harm to the general public’s ability to communicate freely over the internet, it will do massive harm to artists and creators—especially more independent ones, who will be effectively blocked from using these platforms to connect directly with their fans. Rather they will be required to go through “licensed” intermediaries, who will demand a huge cut of any money. In other words, it’s a return to the pre-internet days, where if you wanted to become a professional creator, your only options were to sign away all your rights to giant conglomerate record labels/studios/publishers.⁴⁰

Barlow would have been appalled at the curtailment of freedom of expression and access to knowledge on the Internet that Articles 11 and 13 will almost certainly bring about.

copyright-reform-european-commission/ (noting Google refused to license contents from Spanish and German rights holders when those countries adopted Article 11-like press publisher rights).

³⁸ Mike Masnick, *EU Moves Forward with Agreement to Fundamentally Change the Internet from Open to Closed*, TECHDIRT (Feb. 14, 2019, 2:10 AM), <https://www.techdirt.com/articles/20190213/12071341588/eu-moves-forward-with-agreement-to-fundamentally-change-internet-open-to-closed.shtml>.

³⁹ *Id.*

⁴⁰ *Id.*

The EU's adoption of Article 13 will undoubtedly embolden copyright industries with a global reach to try to export that mandate to other countries. The next target will likely be the U.S. Copyright Office, which has been considering whether to recommend changes to the safe harbor rules Congress adopted in 1998 for ISPs.⁴¹ Under current law, ISPs are not liable for user infringements unless copyright owners provide them with specific notice about the presence of infringing materials on their sites and the ISPs fail to promptly take down the infringing materials.⁴² The U.S. safe harbor rules have, in the view of many, supported freedom of expression on the Internet to a considerable degree.⁴³ Barlow would have considered it a great tragedy for freedom of information, speech, and expression on the Internet if Congress abandons these safe harbors and adopts an EU-style filtering mandate in the misguided hope that doing so would solve the enigma of digitized property, as Barlow so eloquently phrased it.

II. JOHN PERRY BARLOW'S IDEAS FOR ADDRESSING THE ENIGMA OF DIGITIZED PROPERTY

Barlow may have been insightful enough to recognize the enigma of digitized property a quarter of a century ago, but he was not enough of a prophet to articulate a framework for a comprehensive solution. Yet, *The Economy of Ideas* offered some thoughts about plausible strategies. He perceived, for example, the emergence of "a parallel economy developing, mostly among small, fast moving enterprises who protect their ideas by getting into the marketplace quicker than their larger competitors" such as incumbent industries "who base their protection on fear and litigation."⁴⁴ First-mover advantages have indeed proven very important to attaining competitive advantage in the software industry.⁴⁵ Barlow recognized that "people seem to eventually buy the software they really use. Once a program becomes

⁴¹ U.S. COPYRIGHT OFFICE, SECTION 512 STUDY, <https://www.copyright.gov/policy/section512/>.

⁴² 17 U.S.C. § 512 (2012).

⁴³ See, e.g., Electronic Frontier Foundation, Comment Letter on Section 512 Study before the U.S. Copyright Office (Apr. 1, 2016), https://www.eff.org/files/2016/04/01/eff_comments_512_study_4.1.2016.pdf; Electronic Frontier Foundation, Additional Comment Letter on Section 512 Study before the U.S. Copyright Office (Feb. 21, 2017), https://www.eff.org/files/2017/02/22/2015-7_additional_comments_of_eff_512_study.pdf.

⁴⁴ Barlow, *supra* note 1, at 88–89, 18 DUKE L. & TECH. REV. at 16.

⁴⁵ Stuart J.H. Graham et al., *High Technology Entrepreneurs and the Patent System: Results of the 2008 Berkeley Patent Survey*, 24 BERKELEY TECH. L.J. 1255, 1289–90 (2009).

central to your work, you want the latest version of it, the best support, the actual manuals, all privileges attached to ownership.”⁴⁶ The software industry has been very creative over the years in finding ways to monetize its digitized property.⁴⁷

Unsurprisingly, Barlow offered his experience with the Grateful Dead, the rock band for whom he often wrote songs, as an example of how creators can achieve success by encouraging fans to make and share copies of their creations.⁴⁸ The Dead used this strategy of allowing their fans to freely record the band’s live performances to become “the largest concert draw in America.”⁴⁹ Creators who can build relationships with consumers find ways to get paid. Doctors, lawyers, architects, and consultants, for instance, “are already being paid directly for their intellectual property. Who needs copyright when you’re on a retainer?”⁵⁰

More generally, Barlow thought that the ability to monetize creations would depend on “the quality of performance, the uniqueness of your point of view, the validity of your expertise, its relevance to your market, and underlying everything, the ability of that market to access your creative services swiftly, conveniently and interactively.”⁵¹ A point of view, Barlow observed, “is an asset which cannot be stolen or duplicated.”⁵²

Barlow was skeptical, though, about crypto bottling of digital content as a solution to the digitized property enigma.⁵³ In the years after his WIRED article, copyright industries, such as producers of motion pictures and sellers of e-books, have employed technical protection measures (TPMs) to enable them to sell digital copies without undue risk that those digital copies would “leak” and lead to mass infringements.⁵⁴ To provide legal reinforcement for these TPM protections, Congress enacted laws to outlaw bypassing of copyright-protective TPMs as well

⁴⁶ Barlow, *supra* note 1, at 128, 18 DUKE L. & TECH. REV. at 25.

⁴⁷ See, e.g., James Bessen & Walter Frick, *How Software Is Helping Big Companies Dominate*, HARV. BUS. REV. (Nov. 19, 2018), <https://hbr.org/2018/11/how-software-is-helping-big-companies-dominate> (explaining how software enables companies to spread into different areas and creates new business models).

⁴⁸ See Barlow, *supra* note 1, at 126, 18 DUKE L. & TECH. REV. at 21.

⁴⁹ *Id.*

⁵⁰ Barlow, *supra* note 1, at 128, 18 DUKE L. & TECH. REV. at 26.

⁵¹ Barlow, *supra* note 1, at 128, 18 DUKE L. & TECH. REV. at 27.

⁵² Barlow, *supra* note 1, at 126, 18 DUKE L. & TECH. REV. at 22.

⁵³ See Barlow, *supra* note 1, at 129, 18 DUKE L. & TECH. REV. at 27–29.

⁵⁴ See, e.g., Gideon Parchomovsky & Philip J. Weiser, *Beyond Fair Use*, 96 CORNELL L. REV. 96, 102 (2010) (describing content owners’ use of TPMs).

as the development and dissemination of tools to bypass the TPMs.⁵⁵ Barlow's prediction that crypto bottles would fail was, it seems, off the mark. Consumers have adjusted to TPMs more than might have seemed likely in 1994.⁵⁶

Barlow circled back to the digital property enigma in a second WIRED article, *The Next Economy of Ideas*, in 2000.⁵⁷ This article discussed the "paradigm-shattering" Napster phenomenon.⁵⁸ Millions of Internet users downloaded Napster's client-side software and used it to interact with Napster's server-side search and directory functions to share many billions of copies of popular music with one another.⁵⁹ "[T]he geriatrics of the entertainment industry," Barlow observed, "didn't see this coming. They figured the Internet was about as much of a threat to their infotainment empire as ham radio was to NBC. Even after that assumption was creamed, they remained as serene as sunning crocodiles."⁶⁰ These crocodiles, however, didn't stay serene for very long. They sued Napster for contributory copyright infringement and were able to get an injunction to shut down that service.⁶¹

That injunction notwithstanding, Barlow articulated three significant problems for the recording industry: first, network-based technologies such as Napster gave ordinary people "distributive power equal to Time Warner's,"⁶² second, users of these technologies "don't give a flying byte about the existing legal battlements,"⁶³ and third, "[n]o law can be successfully imposed on a huge population that does not

⁵⁵ 17 U.S.C. § 1201 (2012). The origins of this legislation are discussed in LITMAN, *supra* note 10, at 136–45. For critical commentary on these anti-circumvention rules, see, e.g., Pamela Samuelson, *Intellectual Property and the Digital Economy: Why the Anti-Circumvention Regulations Need to Be Revised*, 14 BERKELEY TECH. L.J. 519 (1999).

⁵⁶ For an informative discussion of TPMs used to protect copyrights, see, for example, JONATHAN L. ZITTRAIN, *TECHNOLOGICAL COMPLEMENTS TO COPYRIGHT* (2005).

⁵⁷ See Barlow, *supra* note 10. For a discussion about consumer issues with technically protected content, see, for example, NATALI HELBERGER ET AL., *DIGITAL RIGHTS MANAGEMENT AND CONSUMER ACCEPTABILITY* (Dec. 2004), <https://www.ivir.nl/publicaties/download/INDICAREStateoftheArtReport.pdf>.

⁵⁸ Barlow, *supra* note 10, at 240.

⁵⁹ A&M Records, Inc. v. Napster, Inc., 239 F.3d 1004, 1011, 1019 (9th Cir. 2001).

⁶⁰ Barlow, *supra* note 10, at 240.

⁶¹ *Napster*, 239 F.3d at 1019, 1029.

⁶² Barlow, *supra* note 10, at 240.

⁶³ *Id.*

morally support it and possesses easy means for its invisible evasion.”⁶⁴ Barlow was confident that “[t]he future will win; there will be no property in cyberspace.”⁶⁵

Initially seeming to bear out Barlow’s prediction, a number of more decentralized peer-to-peer file sharing technologies were developed to enable ordinary music lovers to continue file sharing to their heart’s content. Although some of these services were also shut down by copyright injunctions,⁶⁶ the BitTorrent protocol has enabled file sharing to continue apace.⁶⁷ Barlow would not have been surprised at estimates that more than 27.4 million people worldwide engaged in file sharing on a daily basis in 2017.⁶⁸

As an alternative to the seemingly ubiquitous file sharing phenomenon, Apple persuaded the recording industry to license digital music to Apple’s iTunes service so that consumers who wanted to lawfully acquire music could do so conveniently and at a modest price-point.⁶⁹ Spotify, Pandora, and TIDAL are among the entities that have subsequently obtained licenses to popular recorded music.⁷⁰ Spotify alone has about 200 million active monthly users, of whom

⁶⁴ *Id.*

⁶⁵ *Id.* at 241.

⁶⁶ See, e.g., Metro-Goldwyn-Mayer Studios, Inc. v. Grokster, Inc., 518 F. Supp. 2d 1197, 1241 (N.D. Cal. 2007). For a discussion of why *Grokster* was not as much of a win for MGM as it had hoped, see Pamela Samuelson, *Three Reactions to the Grokster Decision*, 13 MICH. TELECOM. & TECH. L. REV. 177 (2006).

⁶⁷ See, e.g., Columbia Pictures Indus. v. Fung, 710 F.3d 1020, 1026–28 (9th Cir. 2013) (explaining BitTorrent’s architecture and how it can be used to engage in infringing conduct).

⁶⁸ *File Sharing Landscape 2017: Where Did Peer-to-Peer Network Users Share Which Files During 2017?*, TECXIPIO MAG. (Jan. 11, 2018), <https://www.tecxipio.com/single-post/file-sharing-in-peer-to-peer-networks-2017>; see generally MEDIA PIRACY IN EMERGING ECONOMIES (Joe Karaganis ed., 2011) (reporting on international studies of media piracy, recommending against heavy enforcement of copyrights).

⁶⁹ See, e.g., Steve Knopper, *iTunes’ 10th Anniversary: How Steve Jobs Turned the Industry Upside Down*, ROLLING STONE (Apr. 26, 2013, 6:45 PM), <https://www.rollingstone.com/culture/culture-news/itunes-10th-anniversary-how-steve-jobs-turned-the-industry-upside-down-68985/>.

⁷⁰ See, e.g., Craig Grannell, *A History of Music Streaming*, DYNAUDIO (May 16, 2018), <https://www.dynaudio.com/dynaudio-academy/2018/may/a-history-of-music-streaming>.

approximately 91 million pay for the service.⁷¹ The upshot is that hundreds of millions of users now have lawful access to an almost unimaginably rich array of digital music through these licensed services. Others, of course, continue to prefer to obtain the music they love through file sharing.

Barlow's prediction that Napster was going to spell the death of copyright⁷² may have been wrong, but that industry weathered the Napster and subsequent file sharing storms only by making considerable adjustments to their business models and providing consumers with a wider array of content at more reasonable prices and with fewer technical restrictions than the industry would have preferred in the immediate aftermath of the *Napster* case.

III. THE SKY IS RISING: THE NEW ECONOMY OF IDEAS IS THRIVING

In *The Next Economy of Ideas*, Barlow predicted that creators would find innovative ways to be rewarded for their works in the new economy: "artists and writers of the future will adapt to practical possibility. Many have already done so. They are, after all, creative people."⁷³ He foresaw a creative milieu in cyberspace in which corporate interests would exercise less control and barriers to entry would be low. Barlow imagined a future of creative output and compensation as part of a larger and more fertile digital ecosystem, available to all. "We can enter into a convenient and interactive relationship with audiences, who, being human, will be far more ethically inclined to pay us than the moguls ever were. What could be a stronger incentive to create than that?"⁷⁴

Yet, even conventional copyright industries have been thriving as never before. Although the Recording Industry of America Association may have been convinced that the "easy availability of freely downloadable commercial songs will bring on the apocalypse,"⁷⁵ empirical data in 2000 showed that "during the two years since MP3 music began flooding the Net, CD sales have risen by 20 percent."⁷⁶ Several economic studies from the 2010s bear out Barlow's skepticism

⁷¹ Daniel Sanchez, *Spotify Now Has 200 Million Monthly Active Users, But How Many of Them Are Paying?*, DIGITAL MUSIC NEWS (Jan. 11, 2019), <https://www.digitalmusicnews.com/2019/01/11/spotify-200-million-monthly-active-users/>.

⁷² Barlow, *supra* note 10, at 240.

⁷³ *Id.* at 252.

⁷⁴ *Id.*

⁷⁵ *Id.* at 241.

⁷⁶ *Id.*

about the “death knell” warnings from legacy industries⁷⁷ that technological change would cause the destruction or decline of most cultural businesses. These studies show that digitization has ushered in a thriving new creative economy and indeed, a “golden age” of creativity, bringing new products to market and enabling new revenue opportunities. One report published in 2012 stated that the value of the worldwide entertainment industry had grown from \$449 billion to \$745 billion between 1998 and 2010.⁷⁸ Moreover, the share of U.S. household spending on entertainment from 2000 to 2008 had increased 15 percent, and new content creation overall ballooned.⁷⁹ A 2014 update of this report, focusing on the U.S. market, confirmed the continued growth of creative outputs among a more diverse array of independent creators,⁸⁰ just as Barlow had predicted. In the digital age, music, video, and books can be produced and distributed by almost anyone who has access to a computer and an internet connection.

Statistics bear out that the entertainment industry is growing both in terms of revenue and quantity of content. According to the latest iteration of this report, “[t]he internet has provided new tools and services that have enabled more creation, more distribution, more promotion, more access to fans and more ways to make money than ever before.”⁸¹ Looking specifically at four sectors—music, film and video,

⁷⁷ See, e.g., Michael A. Carrier, *No, RIAA, It’s Not the End of the World for Musicians*, 83 UMKC L. REV. 287, 287–88 (2014) (describing dire statements made by music industry representatives). *See also supra* notes 3–9.

⁷⁸ MICHAEL MASNICK & MICHAEL HO, THE SKY IS RISING: A DETAILED LOOK AT THE STATE OF THE ENTERTAINMENT INDUSTRY 2 (2012 ed.) [hereinafter SKY IS RISING 2012], <https://www.techdirt.com/skyisrising/> (drawing upon data compiled from PricewaterhouseCoopers (PwC), iDATE, and the Bureau of Labor Statistics).

⁷⁹ *Id.* at 2–3.

⁸⁰ MICHAEL MASNICK & MICHAEL HO, THE SKY IS RISING: A DETAILED LOOK AT THE STATE OF THE ENTERTAINMENT INDUSTRY 4–5, 26 (2014 ed.) [hereinafter SKY IS RISING 2014], <https://www.techdirt.com/skyisrising2014/>. Two additional reports by the same authors looked, respectively, at similar patterns in Europe and the luxury goods market online. *See* MICHAEL MASNICK & MICHAEL HO, THE SKY IS RISING: REGIONAL STUDY (2013), <https://www.techdirt.com/skyisrising2/> (analyzing six European countries); MICHAEL MASNICK & MICHAEL HO, THE SKY IS RISING: LUXURY GOODS (2014), <https://www.techdirt.com/skyisrising/luxury>.

⁸¹ MICHAEL MASNICK & LEIGH BEADON, THE SKY IS RISING: A DETAILED LOOK AT THE STATE OF THE ENTERTAINMENT INDUSTRY 2 (2019 ed.) [hereinafter SKY IS RISING 2019], <https://skyisrising.com/TheSkyIsRising2019.pdf>. *See also* Carrier, *supra* note 77, at 297–98 (describing Kickstarter, “which, as of November 2014, raised \$1 billion from more than 7 million people to fund

books, and video games—the report found that much more content is being produced, the industries are growing, and the internet is largely responsible for the growth.⁸² The report describes the following success stories in the creative economy:

- music: sources show an increased number of new music releases, by more artists, and more ways for fans to consume their music and support them;⁸³
- video entertainment: new and traditional forms of video, including television, film, online streaming services, and user-generated content, are seeing a significant expansion in investment, content creation, and consumer consumption;⁸⁴
- books, ebooks, and audio books: more than ever before, books of all types—digital and print, in the U.S. and elsewhere—are being published (including a growing self-publishing industry) with a wide array of consumer access opportunities;⁸⁵
- video games: with the rise of the mobile gaming market, live game streaming, and e-sports events, online gaming appears to be rapidly expanding, with even more exciting creative possibilities ahead.⁸⁶

Furthermore, content industries—even those that were struggling earlier—are all now thriving. According to the 2019 report, global

73,000 creative products.”); Steven Johnson, *The Creative Apocalypse That Wasn’t*, N.Y. TIMES MAG. (Aug. 19, 2015), https://www.nytimes.com/2015/08/23/magazine/the-creative-apocalypse-that-wasnt.html?_r=1 (“Writers, performers, directors and even musicians report their economic fortunes to be similar to those of their counterparts 15 years ago, and in many cases they have improved. Against all odds, the voices of the artists seem to be louder than ever.”).

⁸² SKY IS RISING 2019, *supra* note 81, at 4.

⁸³ *Id.* at 5–12. See also GLYNN S. LUNNEY, JR., COPYRIGHT’S EXCESS: MONEY AND MUSIC IN THE U.S. RECORDING INDUSTRY (2018) (correlating the rise of file sharing and decline in recorded music sales with the creation of more new music).

⁸⁴ SKY IS RISING 2019, *supra* note 81, at 13–24.

⁸⁵ *Id.* at 25–31. See also JOEL WALDFOGEL, DIGITAL RENAISSANCE: WHAT DATA AND ECONOMICS TELL US ABOUT THE FUTURE OF POPULAR CULTURE 133 (2018) (“Between 2006 and 2015, the number of new self-published e-books rose from essentially zero to just over 150,000 titles per year.”).

⁸⁶ SKY IS RISING 2019, *supra* note 81, at 32–40.

entertainment and media revenues hit the \$1.88 trillion mark in 2017; experts predict these industries will reach \$2.2 trillion in 2021 and continue to grow 4 to 5 percent beyond that. The sky indeed appears to be rising in the age of online creativity and prosperity, just as Barlow had imagined.

Economist Joel Waldfogel has been studying data on the impact of digital technology for creative industries for over a decade. His recent book reports on sales data and critics' and users' reviews and "best of" lists, from which he ascertained that digitization has reduced production costs for creative output and distribution, yet the quality of content has remained high.⁸⁷ Although Waldfogel acknowledges that certain trade-offs occurred, including initial revenue reductions in some legacy media sectors, he concludes that a net gain has resulted from the increased number and quality of new products created:

While declining revenues are creating real pain for many creators and intermediaries, the volume of new materials created, and the apparent satisfaction that consumers and critics derive from the new content, are both very high by historical standards. So the first takeaway is that *we are living through a digital renaissance.*⁸⁸

Other studies have reached similar conclusions. Focusing on independent creators who have posted their works on nine online platforms, a 2018 ReCreate study found that the internet had enabled a substantial infusion of new creators developing new works, often interacting directly with their audiences and earning revenues from online posting activities without the need to rely on traditional gatekeepers such as book publishers, record labels, and movie studios.⁸⁹ That study reported that an estimated 14.8 million Americans posted their works on Amazon, eBay, Etsy, Instagram, Shapeways, Tumblr, Twitch, WordPress, and YouTube in 2016 and earned approximately \$5.9 billion from commercializing their online contents.⁹⁰ Moreover, the number of such creators in 2017

⁸⁷ Waldfogel, *supra* note 85.

⁸⁸ *Id.* at 252–53.

⁸⁹ ROBERT SHAPIRO & SIDDHARTHA ANEJA, UNLOCKING THE GATES: AMERICA'S NEW CREATIVE ECONOMY 3 (2018), <https://www.recreatecoalition.org/wp-content/uploads/2018/02/ReCreate-New-Creative-Economy-Study-Report-508.pdf>; *see also* Carrier, *supra* note 77, at 287 ("[I]nnovations in technology have made it easier for musicians to participate in every step of the creation, development, and marketing process. And . . . forg[e] stronger connections with their fans.").

⁹⁰ SHAPIRO & ANEJA, *supra* note 89, at 3.

grew to 16.9 million (+16.6%) and total revenues to \$6.8 billion (+14.8%).⁹¹

Still other studies confirm Barlow's anecdotal observation that live performances would complement recorded music, importantly contributing to the financial well-being of musicians.⁹² Concert revenues and ticket prices have continued to rise in the digital era:

Concert revenues continue to be a bright spot for the music industry, as the North American concert industry grossed a record-breaking \$5.1 billion in 2013, . . . PwC estimated the U.S. concert business at \$8.61 billion for 2013, growing to \$9.2 billion in 2014 with a compound annual growth rate of 3% through 2017. The actual scarcity for seeing a musical performance live appears to be a healthy and sustainable practice for the foreseeable future.⁹³

Moreover, employment in the U.S. entertainment sector increased by nearly 20 percent between 1998 to 2008.⁹⁴ Another study by the World Intellectual Property Organization (WIPO) found that wage trends for creative workers in the digital age in several countries generally

⁹¹ ROBERT SHAPIRO & SIDDHARTHA ANEJA, *TAKING ROOT: THE GROWTH OF AMERICA'S NEW CREATIVE ECONOMY* 2 (2019), <https://www.recreatecoalition.org/wp-content/uploads/2019/02/ReCreate-2017-New-Creative-Economy-Study.pdf>. The study also surmised that additional (and as-yet unreported) income will have derived from mobile traffic directed from social media. *Id.* at 3; *see also* Giancarlo F. Frosio, *Digital Piracy Debunked: A Short Note on Digital Threats and Intermediary Liability*, 5 INTERNET POL'Y REV. 1, 9 (2016), https://policyreview.info/articles/analysis/digital-piracy-debunked-short-note-digital-threats-and-intermediary-liability#footnoteref16_g7fp0et (describing increased numbers of independent artists and labels in the current music industry).

⁹² *See supra* notes 48–50 and accompanying text.

⁹³ SKY IS RISING 2014, *supra* note 80, at 7; *see also* Carrier, *supra* note 77, at 299 (noting that “[t]ours also offer the opportunity for sponsorship deals that, in the aggregate, are worth billions” including other complements such as apparel); Frosio, *supra* note 91 (citing studies showing that sales of high-priced complements has added to artists’ incomes); Joel Waldfogel, *How Digitization Has Created a Golden Age of Music, Movies, Books, and Television*, 31 J. ECON. PERSPECTIVES 195, 211 (Summer 2017) (citing studies correlating digitization with increased concert ticket sales and ticket prices).

⁹⁴ SKY IS RISING 2012, *supra* note 78, at 2. Following the U.S. recession in late 2008, employment reportedly rose again in some entertainment industries. *See* SKY IS RISING 2019, *supra* note 81, at 9–10 (music); *id.* at 19 (television and cable TV).

outperformed other occupations.⁹⁵ Based on these findings, the study concluded:

From a policy perspective, these results do not lend support to the idea that creators' income situation has systematically worsened with the rise of the internet and its intermediaries, as argued by some commentators in 'value gap' discussions. The income changes creators experience over time are not aligned with general trends in the total population: we see creators losing less or even gaining a better income position in relative terms.⁹⁶

Although the recent studies discussed above have focused mainly on major entertainment industries (i.e., movies, television, books, music, and video games), digitization has had profound impacts on other significant industries, and none more so than computer software. In *The Next Economy of Ideas*, Barlow remarked that the software industry, despite "widespread piracy" was "booming."⁹⁷ Why? Barlow asked. "Because the more a program is pirated, the more likely it is to become a standard."⁹⁸ Barlow thus concluded from this and other examples that "[n]oncommercial distribution of information *increases* the sale of commercial information. Abundance breeds abundance . . . And nothing makes you famous faster than an audience willing to distribute your work for free."⁹⁹

Despite the continued prevalence of software piracy, a 2017 report from the Business Software Alliance estimated the software industry had directly contributed \$564.4 billion to the annual U.S. GDP, with a total value-added to GDP, including indirect impacts, in excess of a trillion dollars a year.¹⁰⁰ It also reported significant job growth of 2.9 million jobs (10.5 million jobs including indirect impacts), which represents a 14.6 percent increase since 2014.¹⁰¹ Software-as-a-service (SaaS) operating in the "cloud" is an increasingly successful business

⁹⁵ Alexander Cuntz, *Creators' Income Situation in the Digital Age* (WIPO, Economic Research Working Paper No. 49, Dec. 2018), <http://www.lisdatacenter.org/wps/liswps/755.pdf>.

⁹⁶ *Id.*

⁹⁷ Barlow, *supra* note 10, at 241.

⁹⁸ *Id.*

⁹⁹ *Id.* at 241–42.

¹⁰⁰ See *The Growing \$1 Trillion Economic Impact of Software*, BSA FOUND. (Sep. 2017), <https://software.org/reports/2017-us-software-impact/> (based on 2016 figures).

¹⁰¹ *Id.*

model for software companies, one that isn't vulnerable to software piracy.¹⁰²

In the 1990s, there was considerable skepticism about the commercial viability of an open source sector of the software industry,¹⁰³ perhaps in part because the open-source software movement seemed to exemplify the open, collaborative spirit that Barlow celebrated in his essays. Yet, somehow and quite remarkably, free and open-source software has become a major force in the industry, not only as an accepted norm in enterprise computing environments, but also through the evolution of financially viable business models.¹⁰⁴ The Linux operating system is perhaps the highest profile example of community developed open-source software,¹⁰⁵ but millions more such projects are ongoing today.¹⁰⁶ Mainstream global corporations, such as IBM, Adobe, and Google, are contributing substantial resources in support of Linux and other open-source projects.¹⁰⁷ Indeed, IBM recently made a \$34

¹⁰² Cory Capoccia, *The Final Frontier for SaaS Is CRM for Main Street*, FORBES (Feb. 22, 2019, 9:00 AM), <https://www.forbes.com/sites/forbestechcouncil/2019/02/22/the-final-frontier-for-saas-is-crm-for-main-street/#c605b2188cc9> (forecasting the global SaaS market to reach \$186 billion by 2024); *see also* Pamela Samuelson, *The Uneasy Case for Software Copyrights Revisited*, 79 GEO. WASH. L. REV. 1746, 1779 (2011) (discussing software-as-a-service and cloud computing).

¹⁰³ *See, e.g.*, Matt Germonprez et al., *Open Source Communities of Competitors*, 20 INTERACTIONS 54, 54 (Nov–Dec 2013); Samuelson, *supra* note 102, at 1777–78.

¹⁰⁴ *See, e.g.*, STEVEN WEBER, *THE SUCCESS OF OPEN SOURCE* (2004); Katherine Noyes, *Open Source Software Is Now a Norm in Businesses*, PC WORLD (May 18, 2011, 10:07 AM), https://www.pcworld.com/article/228136/open_source_software_now_a_norm_in_businesses.html; Max Schireson & Dharmesh Thakker, *The Money in Open-Source Software*, TECHCRUNCH (Feb. 9, 2016), <https://techcrunch.com/2016/02/09/the-money-in-open-source-software/>.

¹⁰⁵ *See, e.g.*, Paul Venezia, *Linux at 25: How Linux Changed the World*, INFOWORLD (Aug. 24, 2016), <https://www.infoworld.com/article/3109204/linux-at-25-how-linux-changed-the-world.html>.

¹⁰⁶ For example, GitHub, a software development platform, reported hosting 31 million developers and 96 million repositories in 2018. *See The State of the Octoverse 2018*, GITHUB BLOG (Oct. 16, 2018), <https://github.blog/2018-10-16-state-of-the-octoverse/>.

¹⁰⁷ *See, e.g.*, Sid Sijbrandij, *How Open Source Became the Default Business Model for Software*, FORBES (Jul. 16, 2018, 8:00 AM), <https://www.forbes.com/sites/forbestechcouncil/2018/07/16/how-open-source-became-the-default-business-model-for-software/#62fcdb974e72> (noting open source investments by Google, Facebook, and Adobe, among others); *see also*

billion offer to buy Red Hat, a leading firm that supplies Linux and other open source software and services to enterprise companies.¹⁰⁸ Another highly successful open source product is the Android platform for smartphones, which Google has been able to monetize in other ways than by sales of copies of the program.¹⁰⁹ Open-source software providers often recoup investments in software development through providing value-added services, such as installation, customization, and maintenance, or complementary assets, such as proprietary add-on programs that perform specialized functions.¹¹⁰

CONCLUDING THOUGHTS

The enigma of digitized property may not have been resolved for all creative sectors. Yet it is remarkable how well the economy of ideas, to use Barlow's term, has evolved over the last quarter-century. Yes, copyright infringement is widespread in the online environment, but millions of people make a multitude of non-infringing uses of copyrighted works online as well. The netizens (to use another now archaic term from the 1990s) of cyberspace have been creating and sharing their creations, thereby promoting the greater public good, as well or better now than at any time in human history.

As much as Barlow would have celebrated the financial successes of so many millions of creators in cyberspace, he would also have been pleased that the economy of ideas includes many millions of people who create and share their creations online for free. Barlow eloquently recognized "the inexplicable pleasures of information itself, the joy of learning, knowing, and teaching; the strange good feeling of

Pamela Samuelson, *IBM's Pragmatic Embrace of Open Source*, 49 COMM. ACM 15 (Oct. 2006).

¹⁰⁸ See Alex Sherman & Lora Kolodny, *IBM To Acquire Red Hat in Deal Valued at \$34 Billion*, CNBC (Oct. 28, 2018), <https://www.cnbc.com/2018/10/28/ibm-to-acquire-red-hat-in-deal-valued-at-34-billion.html>. Also in 2018, Microsoft acquired GitHub for \$7.5 billion. See Clint Finley, *Why 2018 Was a Breakout Year for Open Source Deals*, WIRED (Dec. 23, 2018, 11:00 AM), <https://www.wired.com/story/why-2018-breakout-year-open-source-deals/>.

¹⁰⁹ See, e.g., Bogdan Petrovan, *How Does Google Make Money from Android?*, ANDROID AUTHORITY (Jan. 22, 2016), <https://www.androidauthority.com/how-does-google-make-money-from-android-669008/> (surmising that mobile advertising and app sales contribute to Google's Android business).

¹¹⁰ See, e.g., Paul-Noël Guély, *Open-Source Software: From the Periphery of Tech to the Mainstream of Finance*, FORBES (Sep. 3, 2018, 7:45 AM), <https://www.forbes.com/sites/paulnoelguely/2018/09/03/open-source-software-from-the-periphery-of-tech-to-the-mainstream-of-finance/#4472149269ab>.

information coming into and out of oneself.”¹¹¹ Those who share their creations freely, said Barlow, “are getting paid in something besides money,” for there is joy for many in the act of sharing.¹¹²

Those who like to tinker with digital copies of creative works, such as by making remixes or mashups, have been able to participate in the new creative economy as never before.¹¹³ Digitization has made it possible not only to playfully build upon existing works, but also to share those playful creations with others via online video-sharing services.¹¹⁴ Fan fiction has also emerged as another robust sector of the new economy.¹¹⁵ This resonates with Barlow’s contention that ideas and information are “conveyed by propagation, not distribution.”¹¹⁶ As with jazz improvisations, stand-up comedy routines, and mime performances, Barlow characterized information as an activity, oblivious of copyright protection, flourishing with a life of its own.¹¹⁷

¹¹¹ Barlow, *supra* note 1, at 127, 18 DUKE L. & TECH. REV. at 23.

¹¹² Barlow, *supra* note 1, at 127, 18 DUKE L. & TECH. REV. at 24. For a theoretically rich account of this transformation, see, for example, YOCHAI BENKLER, *THE WEALTH OF NETWORKS: HOW SOCIAL PRODUCTION TRANSFORMS MARKETS AND FREEDOM* (2007).

¹¹³ See, e.g., LAWRENCE LESSIG, *REMIX: MAKING ART AND COMMERCE THRIVE IN A HYBRID ECONOMY* (2008).

¹¹⁴ See, e.g., David Lange, *At Play in the Fields of the Word: Copyright and the Construction of Authorship in the Post-Literate Millennium*, 55 LAW & CONTEMP. PROBS. 139 (1992); Pamela Samuelson, *Freedom to Tinker*, 17 THEORETICAL INQ. L. 563, 564 (2016). See generally ERIC VON HIPPEL, *DEMOCRATIZING INNOVATION* (2005); KAL RAUSTIALA & CHRISTOPHER SPRIGMAN, *THE KNOCKOFF ECONOMY: HOW IMITATION SPARKS INNOVATION* (2012) (describing several industry sectors in which the freedom to copy promotes creativity).

¹¹⁵ See, e.g., ORGANIZATION FOR TRANSFORMATIVE WORKS, *WHAT WE BELIEVE*, http://www.transformativeworks.org/what_we_believe/ (last visited Mar. 20, 2019).

¹¹⁶ Barlow, *supra* note 1, at 89, 18 DUKE L. & TECH. REV. at 17.

¹¹⁷ Barlow, *supra* note 1, at 90, 18 DUKE L. & TECH. REV. at 18. Barlow also observed that “[i]nformation is a relationship.” Barlow, *supra* note 1, at 126, 18 DUKE L. & TECH. REV. at 20. The WIPO study also recognized that

[a]rtists do not have uniform motivations to create. Policy deliberations should thus take into account non-monetary sources of artists’ motivation and carefully build incentive schemes targeting overall psychic income, rather than focusing on income issues alone. For example, changes in legal and other mechanisms can affect peer recognition and ease of attribution of works, which ultimately influence creators’ job satisfaction and further creativity. Income-focused reforms might effectively lead to missing policy goals.

Barlow was an enthusiastic endorser of open access for copyrighted works when he spoke at the 2003 launch of the Creative Commons (CC).¹¹⁸ The uptake of CC licensed works since then may have exceeded the high expectations of its founders. Over 1 billion creative works are now available under CC licenses on millions of Internet sites.¹¹⁹ While many (and perhaps most) of these CC licensed works are freely shared without restrictions, authors can retain rights to control commercial exploitations by making their works available under CC-NC licenses, which only allows free use for non-commercial purposes. Many well-known authors have published digital versions of their books under CC licenses so they are widely available to all online users, but the authors still earn royalties on the sale of physical books.¹²⁰ Millions of scholarly works are now freely available through digital repositories, as colleges and universities have increasingly adopted open access policies for their faculties' scholarly research outputs.¹²¹

Digitization has been beneficial not only for the creation and dissemination of new works, but also in extending the "long tail" of in-copyright works that previously would have faded from public view as they went out of print. Mass digitization of books from research institutions has enabled older works to be rediscovered and used in novel ways.¹²² By digitizing millions of books from research library collections, indexing them, and serving up snippets of the books in response to search queries, Google made it possible for researchers to discover books relevant to their work and provide information on where

See Cuntz, *supra* note 95, at 46.

¹¹⁸ See John Perry Barlow at Creative Commons Launch (2002), <https://archive.org/details/Ireincclauch2a-jpbarlow-ires>.

¹¹⁹ *List of major Creative Commons licensed works*, WIKIPEDIA, https://en.wikipedia.org/wiki/List_of_major_Creative_Commons_licensed_works (last visited Apr. 4, 2019).

¹²⁰ See, e.g., Cory Doctorow, *Giving It Away*, FORBES (Dec. 1, 2006, 12:00 PM), https://www.forbes.com/2006/11/30/cory-doctorow-copyright-tech-media_cz_cd_books06_1201doctorow.html#36825d278c20; Made with Creative Commons: Knowledge Unlatched, MEDIUM (Sep. 18, 2017), <https://medium.com/made-with-creative-commons/knowledge-unlatched-a36a822bc77c> (describing case studies).

¹²¹ See, e.g., OPEN ACCESS AND SCHOLARLY PUBLISHING, HARVARD LAW SCHOOL, <https://hls.harvard.edu/library/for-faculty/open-access-and-scholarly-publishing/> (last visited Mar. 20, 2019).

¹²² See, e.g., Matthew Sag, *Orphan Works as Grist for the Data Mill*, 27 BERKELEY TECH. L.J. 1503 (2012).

copies of those books could be located.¹²³ The HathiTrust digital library, which was formed by Google's library partners pooling digital copies of books from their collections, now allows researchers from consortium members to conduct searches across a corpus of more than 16 million books to find ones that are relevant.¹²⁴ Barlow would have been pleased by this development and would have supported the initiative of some libraries to engage in controlled digital lending of books that libraries initially acquired in physical form,¹²⁵ following the lead of the Internet Archive with its online Open Library.¹²⁶

John Perry Barlow had a vision of an economy of ideas in which information would flow freely through the Internet ether. While his hope that copyright would disappear in the new creative economy is unlikely to transpire, there is some reason to hope that policymakers will come to recognize that creative sectors of the economy are thriving. Barlow insisted that

we have a profound responsibility to be better ancestors. What we do now will likely determine the productivity and freedom of 20 generations of artists yet unborn. So it is time to stop speculating about when the new economy of ideas will arrive. It's here. Now comes the hard part, which also happens to be the fun part: making it work.¹²⁷

As a tribute to Barlow, let's not screw things up by adopting stronger copyright rules that will inhibit rather than promote the progress of science, as the Constitution directs.¹²⁸

¹²³ See, e.g., *Authors Guild v. Google, Inc.*, 804 F.3d 202, 209 (2d Cir. 2015); *Authors Guild v. HathiTrust*, 755 F.3d 87, 97 (2d Cir. 2014).

¹²⁴ *September 2018 Update*, HATHITRUST, <https://www.hathitrust.org/september-2018-update>. A recent article presents evidence that digitization may in fact enhance demand and increase the sales or reprintings for certain types of physical books. See Abhishek Nagaraj & Imke Reimers, *Digitization and the Demand for Physical Works: Evidence from the Google Books Project* (Feb. 21, 2019), <https://ssrn.com/abstract=3339524>.

¹²⁵ See POSITION STATEMENT ON CONTROLLED DIGITAL LENDING, CONTROLLED DIGITAL LENDING BY LIBRARIES (Sept. 2018), <https://controlleddigitallending.org/statement>.

¹²⁶ See *Open Library*, INTERNET ARCHIVE, <https://openlibrary.org/> (last visited Mar. 20, 2019).

¹²⁷ Barlow, *supra* note 10, at 252.

¹²⁸ U.S. CONST. art. I, § 8, cl. 8.