

**WILL GOOGLE V. ORACLE  
SAVE THE WORLD'S CULTURAL HERITAGE?**

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*Copyright scholars and policymakers have largely approached the shift from analog to digital media through the lens of copy-making and sharing, often overlooking the inherent fragility and ephemerality of digital objects due to their dependence on specific software and hardware. This software dependency poses a significant threat to long-term access to digital cultural heritage, from historical newspapers and architectural records to video games and scientific research, as obsolete or commercially unavailable software renders these digital files meaningless. While the challenges of technological obsolescence, media fragility, and market failures have long been recognized by librarians and archivists as harbingers of a "digital dark age," the specific implications of software copyright for cultural preservation have been largely absent from policy discussions.*

*This paper argues that the Supreme Court's decision in Google v. Oracle offers a critical turning point for addressing the copyright impediments to software preservation and access. Justice Breyer's majority opinion, informed by his long-standing scholarship on software copyright, articulates a robust understanding of fair use, particularly its application to functional works like software. By emphasizing the "transformative" nature of uses that enable new purposes (such as teaching and research) and by clarifying that copying entire works can be fair when tethered to a valid transformative purpose, Google v. Oracle provides a strong legal foundation for cultural heritage institutions. Coupled with the insights from Apple v. Corellium, the Code of Best Practices in Fair Use for Software Preservation, and successful DMCA rulemaking exemptions, this ruling empowers libraries and archives to leverage fair use to ensure the enduring accessibility of software-dependent digital heritage, thereby realigning copyright with its fundamental purpose of promoting progress.*

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<sup>1</sup> Jaszi Butler PLLC. I am deeply grateful to Sean Flynn, Michael Palmedo, and the Program on Information Justice and Intellectual Property at American University Washington College of Law for commissioning this paper and facilitating my participation in several workshops with other scholars working on papers related to copyright's impact on research. Members of the Arcadia Right to Research in International Copyright Law project provided valuable feedback on early drafts of this paper and helped to steer me in the right direction. Elizabeth Townsend Gard gave invaluable feedback that helped turn a draft paper into a more coherent, rigorous final product. And none of this work would have been possible without the invaluable experience I've had working with and for the Software Preservation Network, its members, and its fiscal sponsor and host, the Educopia Institute. All errors are my own.

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“So long as men can breathe or eyes can see  
So long lives this, and this gives life to thee.”<sup>2</sup>

### INTRODUCTION

Copyright practitioners and policymakers discuss the shift from analog to digital media mostly in terms of the ease of making and sharing copies, which gives the impression that digital copies are more abundant than analog copies.<sup>3</sup> But abundance is not the same thing as endurance. Digital copies are fragile and ephemeral in important ways. Every digital object is an inscrutable string of ones and zeroes without the right software and hardware to interpret and render it in a format (pixels on a screen, sounds through speakers, braille on a reader pad) legible to humans. Without the relevant software, digital files become meaningless. Software dependency has threatened access to

<sup>2</sup> William Shakespeare, *Sonnet 18* (quoted in Jeff Rothenberg, *Ensuring the Longevity of Digital Documents*, 272 *SCI. AM.* 42–47 (1995)).

<sup>3</sup> See, e.g., U.S. Info. Infrastructure Task Force Working Grp.on Intell. Prop. Rts., *Intellectual Property and the National Information Infrastructure: The Report of the Working Group on Intellectual Property Rights* 10 (1995) [hereinafter NII White Paper] available at [https://www.eff.org/files/filenode/DMCA/ntia\\_dmca\\_white\\_paper.pdf](https://www.eff.org/files/filenode/DMCA/ntia_dmca_white_paper.pdf) (“Just one unauthorized uploading of a work onto a bulletin board, for instance -- unlike, perhaps, most single reproductions and distributions in the analog or print environment -- could have devastating effects on the market for the work.”).

newspapers,<sup>4</sup> architectural records,<sup>5</sup> photographs,<sup>6</sup> video games,<sup>7</sup> and scientific research,<sup>8</sup> among other kinds of records. Without the right combination of hardware and software, these works are as good as gone.

This is also true for vinyl records and VHS tapes: without the right machine, many forms of media become inaccessible. But unlike records and VHS tapes, which will play on any VCR or turntable, digital files can be dependent on highly specialized software sold by a single vendor, or complex combinations of software sold by multiple vendors, as well as hardware. And crucially, unlike turntables and VCRs, software is a “machine made of text”<sup>9</sup> that copyright law treats as a literary work. It’s as if you couldn’t play a copy of The Beatles’ *White Album* unless you also had a copy of Don DeLillo’s *White Noise*: copyright encumbers both the work and the machine required to read it.

In the short term, when the relevant software is readily available on the market, the impact of software dependency on access may be negligible, no different in principle than turntable-dependency or VCR-dependency. But in the long term, as software becomes obsolete, goes out of print, or both, the implications for access to digital culture get more serious. It’s as if you couldn’t play a copy of the *White Album* without a copy of a newspaper from November 22, 1968; that’s the mismatch we see between the cultural life

<sup>4</sup> David Cirella, *CD-ROM Preservation: Acquisition, validation, and access by way of proprietary file formats, legacy software, and language support*, OPEN PRESERVATION FOUND., (June 9, 2020) [https://openpreservation.org/wp-content/uploads/public/resources/opfcon/2020/Cirella\\_OPFCON\\_Poster\\_200609.pdf](https://openpreservation.org/wp-content/uploads/public/resources/opfcon/2020/Cirella_OPFCON_Poster_200609.pdf) (CD-ROM archive of Japanese newspaper Yomiuri Shimbun (1874-1970) used proprietary file formats inaccessible with modern software tools, and specialized viewer software required Japanese edition of Windows 98).

<sup>5</sup> Artefactual Sys. and the Digital Pres. Coal., *Preserving CAD* (2021), <http://doi.org/10.7207/twgn21-15> (architectural designs “created in CAD software from the 1960s to 2000s are now extremely difficult to render because the software either no longer exists or no longer opens early versions of the format”).

<sup>6</sup> *PhotoCD*, WIKIPEDIA, [https://en.wikipedia.org/wiki/Photo\\_CD](https://en.wikipedia.org/wiki/Photo_CD) (last visited Dec. 9, 2021) (proprietary photo digitization format in use from 1990-2004 was abandoned by the proprietor, who never released the specifications for the format, and modern reader software can facilitate “only basic, low resolution” export of images).

<sup>7</sup> Matthew T. Clements & Hiroshi Ohashi, *Indirect Network Effects and the Product Cycle: Video Games in the U.S., 1994-2002*, 53 J. INDUS. ECON. 515, 528 (2005) (video game software has an average commercial life of 4 years, after which time new copies become unavailable on the primary market); Henry Lowood, Devin Monnens, et al., *Before It’s Too Late: A Digital Game Preservation White Paper*, 2 AM. J. PLAY. 139, 140 (2009) (“Every year, thousands of games move one step closer to oblivion as a result of the same threats to longevity that affect all digital media: bit rot and obsolescence”); Jon-Paul C. Dyson, *Collecting, Preserving, and Interpreting the History of Electronic Games*, 10 AM. J. PLAY. 1 (2017) (“even if the [video game] information is intact, the operating systems, codecs, and other pieces of software necessary to run programs of the type the game uses may be compromised and nonfunctional”).

<sup>8</sup> Anastasia Ershova & Gerald Schneider, *Software updates: the “unknown unknown” of the replication crisis*, LSE IMPACT BLOG LSE Impact Blog, (Jun. 7, 2018), <https://blogs.lse.ac.uk/impactofsocialsciences/2018/06/07/software-updates-the-unknown-unknown-of-the-replication-crisis/> (describing how updates to proprietary research software can change algorithms used to calculate research results, casting doubt on their reliability over time).

<sup>9</sup> Pamela Samuelson, Randall Davis, Mitchell D. Kapor, & J.H. Reichman, *A Manifesto Concerning the Legal Protection of Computer Programs*, 94 COLUM. L. REV. 2308 (1994).

of many digital works and the commercial and physical life of the software on which those works depend. This paper explores the implications of this dependency, how we got here, and the prospects for long-term preservation of software and software-dependent copies in the shadow of software copyright. The story starts off in fog and gloom, as unanticipated challenges threaten our shared cultural heritage, but it ends in hope: thanks to the Supreme Court's decision in *Google v. Oracle*, the fair use doctrine is poised once again to play its essential role in limiting copyright monopolies when they threaten to undermine the goals of copyright itself.

Part I of the paper will describe the challenges that research institutions face as they work to collect, preserve, and provide access to digital materials. Copyright is just one of the challenges involved here, and not an insurmountable one, but a serious one. Part II of the paper will explore the software copyright debates that raged from the 1970s into the 1990s and show how these debates did and did not anticipate the digital dark age threat described in Part I. Finally, Part III will explore the present-day landscape of copyright limitations and exceptions favoring preservation and research, outlining the most promising strategies for applying these to software to help bring the copyright system back into alignment with the needs of researchers and culture writ large.

### *1. THE LOOMING DIGITAL DARK AGE: THE PROBLEMS OF PRESERVING BORN DIGITAL MEDIA FOR RESEARCH.*

Research entails a distinctive form of information access and use, one that differs from ordinary consumer use in a variety of ways. Fundamentally, research differs from ordinary information consumption because of its purpose: while a lay consumer may sometimes hope to learn something new from the media she uses, a researcher aims to create new knowledge based on what she learns. And the standard for novelty in a research setting is generally quite high: it involves convincing peers with deep knowledge of a subject area that may be hundreds of years old that, in some meaningful sense, what you say has never been said before.

The quest to contribute something truly new prompts the researcher to look broadly and deeply. They may consult obscure texts, marginal works, and archival materials that were never intended for public consumption, or follow citation trails back to sources that long ago went out of vogue. Ideas that never caught on, trends that fell out of fashion, voices that were marginalized in their time, records that were made for purely private purposes—these are all valuable raw materials to a scholar for the same reason they are of little interest to the lay reader: when consulted through the lens of deep expertise, they can provide or catalyze insights that are not yet part of our collective body of knowledge. Access to these kinds of materials is essential to promoting the progress of “Science” as that word was broadly understood at the time of the drafting of the US Constitution—the body of learning and knowledge generally, whether in the humanities or in science, technology, engineering, and medicine.

The difference between scholarly researchers and ordinary consumers is borne out if you compare the contents of a research library collection to those of a bookstore or even a public library. Most research collections are comprised of thousands of items that may go untouched for years, even decades. Of course, a good library will be tailored somewhat to the research interests of its users, and no research library can or should collect

indiscriminately. Even the world's largest library, the U.S. Library of Congress, with its mandatory copyright deposit mechanism,<sup>10</sup> has designated entire categories of works as only subject to mandatory deposit if the Library affirmatively demands it.<sup>11</sup> Research collections are meant to preserve our cultural record for posterity, not just respond to short-term consumer demand.<sup>12</sup>

Because they think in terms of preserving and providing access for centuries rather than years or even decades, and because they collect all kinds of materials and not just works available in standard, easily preserved formats, librarians and archivists have foretold the coming of a "digital dark age" for decades.<sup>13</sup> Copyright scholars, practicing attorneys, and policymakers could learn a lot from this literature, as it contradicts or at least casts doubt on some of the assumptions about digital media (occasionally stated, but often implied) that have driven copyright policy.<sup>14</sup> This Part will recapitulate librarians' and archivists' core claims about challenges associated with collecting and preserving digital media. Many of the challenges facing digital preservation are actually surmountable, and some have been surmounted, but interestingly, the copyright challenge is both over- and under-estimated in the preservation literature.

The challenges to persistence of digital culture outlined in the preservation literature are diverse and complex. This summary is necessarily simplified. However, hopefully it will suffice to give readers with a legal background a sense of what research institutions face as they strive to build and preserve research collections of born-digital materials.

#### *A. Market failure(s)*

First, the profit motive is typically insufficient to ensure commercial actors will maintain digital works and supporting technologies in circulation over the long term. One study found that video game software, for example, has an average commercial life of 4 years, after which time new copies become unavailable on the primary market.<sup>15</sup> A more recent video game study found that the vast majority of games published before 2010 are

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<sup>10</sup> See generally 17 U.S.C. § 407.

<sup>11</sup> See 37 C.F.R. § 202.19(c). Perhaps most evocative for the purposes of this paper is §202.19(c)(5), "Electronic works published in the United States and available only online. This exemption includes electronic-only books and electronic serials available only online...."

<sup>12</sup> See, e.g., Preservation Services, UNIV. OF VA. LIBRARY, (last visited April 26, 2025), <https://library.virginia.edu/preservation> ("We strive to maximize the life expectancy and utility of collections, regardless of format, for current and future scholars.")

<sup>13</sup> See, e.g., Terry Kuny, *A Digital Dark Ages? Challenges in the Preservation of Electronic Information*, 63RD IFLA (International Federation of Library Associations and Institutions) Council and Gen. Conf. (1997) ("[W]e are moving into an era where much of what we know today, much of what is coded and written electronically, will be lost forever."). In 2011, the Computer History Museum published an amazing short video simply called "Digital Dark Age" that explains the challenge of digital preservation vividly in less than five minutes. Computer History Museum, *Digital Dark Age* (2011), available at <https://www.computerhistory.org/revolution/memory-storage/8/325/2208>.

<sup>14</sup> See Part II, *infra*.

<sup>15</sup> Matthew T. Clements & Hiroshi Ohashi, *Indirect Network Effects and the Product Cycle: Video Games in the U.S., 1994-2002*, 53 J. INDUS. ECON 515, 528 (2005)

no longer commercially available.<sup>16</sup> Indeed, the study found that video games from the 1980s are as hard to find on the market as silent films and pre-war sound recordings.<sup>17</sup> Similar studies have shown the modest commercial life of other media,<sup>18</sup> as well as the illusory nature of the so-called “long-tail” phenomenon that promised to bring obscure works into commercial availability in the digital network era.<sup>19</sup> As Abbey Smith Rumsey observes, “It is unrealistic to assume that in market capitalism, publishers, movie studios, recording companies, and other commercial enterprises will preserve their content after it loses its economic and commercial value or becomes part of the public domain. This is what libraries do.”<sup>20</sup>

Unfortunately, this is *not* what libraries do with respect to a substantial and growing body of digital-only works. The second problem of the market for libraries is obtaining lawful ownership of digitally distributed works. Distributors like Netflix for video, Spotify and Apple for music,<sup>21</sup> and most of the major trade publishers of books simply will not sell digital copies to libraries.<sup>22</sup> Indeed, in the case of video and music, they won’t even license access to libraries. In some cases, we can only speculate about why this is, but in the case of trade books, some publishers have said explicitly that they believe library ebook lending hurts sales.<sup>23</sup> The market is thus not only failing to support the collection and preservation of digital culture by libraries, but in at least some cases it appears to be actively, intentionally preventing it.

And of course, a third “failure” of the market occurs with respect to works that were never intended to be sold. Business and non-profit archives, government documents, personal “papers” (whether of prominent or ordinary people), all are created for private purposes and rarely, if ever, come to be managed by a commercial actor interested in monetizing them. These materials are collected, preserved, and made available to researchers only if libraries and archives take responsibility for them. An upside of these materials existing outside of markets is that they can be transferred to libraries outright, without the tangle of licensing issues that encumber commercially distributed digital

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<sup>16</sup> Phil Salvador, *Survey of the Video Game Reissue Market in the United States*, (2023), <https://zenodo.org/record/8161056> (last visited Aug 24, 2023).

<sup>17</sup> *Id.* at 2.

<sup>18</sup> See, e.g., Tim Brooks, *Survey of Reissues of U.S. Recordings* (2005) (“On average, rights owners have made available 14 percent of the historic recordings that they control”).

<sup>19</sup> See, e.g., Mark Mulligan, *The Death of the Long Tail*, MUSIC INDUS. BLOG, (2014) <https://musicindustryblog.wordpress.com/2014/03/04/the-death-of-the-long-tail/> (“The recorded music market is a ‘Superstar artist’ economy with the top 1% of musical works accounting for 77% of all artist revenues”).

<sup>20</sup> Abby Smith Rumsey, *When We Are No More*, 151 (2016)

<sup>21</sup> Judy Tsou & John Vallier, *Ether Today, Gone Tomorrow: 21st Century Sound Recording Collection In Crisis*, 72 NOTES 461 (2016), <https://www.jstor.org/stable/44015273> (last visited Jun 17, 2022).

<sup>22</sup> See *Hachette Book Grp., Inc. v. Internet Archive*, 115 F.4th 163, 175 (2d Cir. 2024) (“For libraries, the result is regular renegotiation of eBook licenses that often come at a steeper price and for a shorter term than print copies of the same books.”)

<sup>23</sup> See, e.g., Andrew Albanese, *Macmillan CEO John Sargent: ‘We’re Not Trying to Hurt Libraries,’* PUBLISHERS WEEKLY, <https://www.publishersweekly.com/pw/by-topic/industry-news/libraries/article/81596-macmillan-ceo-john-sargent-we-re-not-trying-to-hurt-libraries.html> (last visited Aug 17, 2023).

works. A downside is that these digital materials are typically dependent on software that may have been sold or licensed only for personal or business use, casting a cloud over their availability to libraries for use in ensuring long-term preservation and access to the materials in the archive.

### *B. Media fragility*

The physical media on which digital works have been stored for the last half-century or so can be extraordinarily fragile, especially compared to analog counterparts like cuneiform tablets, parchment documents, and other media that have survived for hundreds and even thousands of years under ordinary storage conditions. The advertised physical lifespan of some digital storage media has been extravagant—decades and even hundreds of years. But the observed reality is that digital storage media lifespans can vary wildly, with the low end of the range for optical (CD), tape, and magnetic disk at 5 years or less.<sup>24</sup>

### *C. Technological obsolescence*

Digital technology changes rapidly, and the hardware and software tools needed to access digital information can disappear from commercial circulation even more quickly than the information itself. This challenge arises due not only to the end of commercial availability of a particular technology, but also to the eventual disappearance of even the means of repairing what's in existence, including spare parts and technical know-how.<sup>25</sup> Thus, Jeff Rothenberg observes in his seminal article on preserving digital documents, “It is only slightly facetious to say that digital information lasts forever—or five years, whichever comes first,”<sup>26</sup> due to the inevitability of technological obsolescence regardless of the durability of the underlying medium.

### *D. Technological dependence*

The expressive or intellectual content of digital works cannot be accessed directly by humans, but rather must be translated into human-perceptible form by a technological environment (a combination of specific hardware and software). As Rothenberg explains, “A file is not a document in its own right—it merely describes a document that comes into existence when the file is interpreted by the program that produced it. Without this program (or equivalent software), the document is a cryptic hostage of its own encoding.”<sup>27</sup> This means that preservation of a digital work on its own will not suffice for

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<sup>24</sup> Jeff Rothenberg, *Ensuring the Longevity of Digital Information*, (rev. Feb. 22, 1999) <https://www.clir.org/wp-content/uploads/sites/6/ensuring.pdf>.

<sup>25</sup> See generally Mike Casey, *Why Media Preservation Can't Wait: The Gathering Storm*, 44 IASA J. 14 (2015). (Casey's proposed solution is migrating works stored on obsolescing media to new media as quickly as possible, and repeating as necessary.)

<sup>26</sup> Rothenberg, *supra* n. 24 at 2.

<sup>27</sup> *Id.* at 44.

access; the work and its full panoply of supporting technology must be preserved and made accessible together in a package.<sup>28</sup>

#### *E. Cost and risk of content migration*

Moving digital content from one format or medium to another can be costly and difficult.<sup>29</sup> Moreover, migration risks loss or distortion of information.<sup>30</sup> These risks are especially acute, even intolerable, in a research context, where access to authentic, reliable information is paramount. Alterations in migration are, incidentally, another failure of the market with respect to re-issues of legacy works, from video games to sound recordings: rights holders have a market incentive to “improve” titles they reissue (to add new content, change audio or video resolution, remove politically disfavored content, and so on), to meet changing consumer expectations and give owners of original versions a reason to buy again. For many research purposes, however, these “improvements” are corruptions – they remove information from the original and add unwanted new elements that make it harder to make accurate observations about the original artifact.

#### *F. Sheer magnitude and overwhelm*

The amount of digital content created each day, much less published, is extraordinary.<sup>31</sup> Libraries and archives have always had to be selective in the materials they collect and preserve, but the pool of material from which they must choose has never been larger or grown more quickly.

#### *G. Legal uncertainty*

In the library and archives literature, the law is often portrayed as unclear and unsettled.<sup>32</sup> Librarians and archivists generally believe that copyright law as it relates to

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<sup>28</sup> *Id.* at 42-45 (explaining the steps necessary to interpret a “bitstream” of digital 1s and 0s from a digital storage medium and convert that stream into a human perceptible work). *See also*, Euan Cochrane, *Rendering Matters* (2012) (“When files are rendered in environments that differ from the original then they will often present altered information to the user”).

<sup>29</sup> Commission on Preservation & Access & Research Libraries Grp., *Preserving Digital Information: Report of the Task Force on Archiving of Digital Information* (1996) [hereinafter “PDI Task Force Report”] (“forward migration of the information to a new standard or application program is, as anyone knows who has witnessed or participated in such a process, time-consuming, costly and much more complex than simple [copying from one storage medium to another]”); Avra Michelson & Jeff Rothenberg, *Scholarly Communication and Information Technology: Exploring the Impact of Changes in the Research Process on Archives*, 55 *THE AM. ARCHIVIST* 236 (1992).

<sup>30</sup> *Id.* at 298 (“Like an illiterate monk dutifully copying text in a lost language, migration may save the bits but lose their meaning.”)

<sup>31</sup> *See, e.g.*, YouTube for Press, *YOUTUBE OFFICIAL BLOG*, <https://blog.youtube/press/> (last visited April 6, 2025)(500 hours of content are uploaded to YouTube every minute); Wikipedia:Statistics, *WIKIPEDIA*, <https://en.wikipedia.org/wiki/Wikipedia:Statistics> (April 2, 2025)(Wikipedia was edited 18 times per second in 2024).

<sup>32</sup> *See, e.g.*, Donna Ferullo, *Managing Copyright in Higher Education: A Guidebook 1* (2014) (“The US Copyright Act lags behind the rapidly changing technology, which makes it difficult to

libraries and archives was designed for an analog world, and digital technologies radically unsettle their expectations about what is permissible.<sup>33</sup> As discussed further in Part III, fair use and similar open-ended exceptions hold the greatest promise for responding to this challenge, but risk-averse institutions often prefer to rely on the specific limitations and exceptions found in Sections 108, 109, and 110 of the Copyright Act. Because these provisions have not kept pace with digital change, research institutions will have to learn to better leverage the broad rights they have under Section 107, fair use.

## II. THE SOFTWARE COPYRIGHT DEBATE(S)

To the contents of this Pandora's Box of digital preservation and access challenges, we can add a second-order problem: virtually all of the software that's required to faithfully render digital records is itself encumbered by copyright. Before exploring how this came to be, and what that tells us about the failings of copyright policy, it is worth noting that software itself is also subject to most of the digital challenges described above:

- Market failures: Self-evidently, it is extremely rare for a particular version of a software title to remain on the market for even a fraction of the century or more during which it will be encumbered by copyright. While some software titles, like Microsoft Word or AutoCAD, have a long history, specific versions are frequently superseded. Specific versions are often required to faithfully render contemporaneous files, as previous and subsequent versions may not be forward or backward compatible, or may change the way the file is rendered. Very few obsolete software titles are sold or licensed to libraries or archives on terms that facilitate long-term preservation and access.
- Media fragility: software has been created, published, and stored on every kind of digital storage medium, and is subject to all the risks of loss associated with these media.<sup>34</sup>
- Technological obsolescence: most software can only be run on specific hardware (though emulation technology promises to help solve this problem).<sup>35</sup>
- Technological dependence: most software programs rely on other software programs—operating systems, plug-ins, and the like—which are in turn encumbered by copyright and subject to all the threats described here.<sup>36</sup>

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determine how the laws apply in a given situation.”); Peter B. Hirtle, Emily Hudson & Andrew T. Kenyon, *Copyright & Cultural Institutions ix* (2009). (“Drafting and implementing copyright procedures often reveals the uncertainties in the law and demonstrates how difficult it can be to apply abstract legal principles to specific circumstances.”).

<sup>33</sup> See, e.g., Rumsey, *supra* n. 20, at 150 (“in the digital age, the fundamental mission of libraries and archives to preserve and make knowledge accessible is at risk because there is no effective exemption from copyright law that covers the specific technical preservation needs of digital data.”); *PDI Task Force Report* at 6 (“The state of the copyright law, which was generated and developed in an analog world but is applied in an increasingly digital universe, is itself confusing and uncertain”).

<sup>34</sup> See *supra* n. 29 and accompanying text.

<sup>35</sup> See *supra* n. 30-31 and accompanying text.

<sup>36</sup> See *supra* n. 32-33 and accompanying text.

- Cost and risk of migration: just as digital documents can be “migrated” to be readable in a new format, software can be “ported” to operate in new environments, but similar costs and risks apply.<sup>37</sup>
- Sheer magnitude: the number and variety of software programs created has exploded over time.<sup>38</sup>
- Legal uncertainty: until very recently,<sup>39</sup> the scope of lawful library and archival reuse of software has been seen as either too narrow or too uncertain to give research institutions the confidence they need to collect and provide access to software titles at scale.

This final challenge – the uncertainty and doubt caused by copyright protection for software – is especially frustrating when you consider that the legal landscape did not have to turn out this way. Policymakers could have considered the impact that bringing software into the copyright regime would have on long-term access to software-dependent works. They did not.

#### *A. The Limited Scope of the Software Copyrightability Debate*

Whether and how to provide copyright protection to software was a hot topic among scholars and policymakers from the 1970s into the 1990s. The literature reflects a wide array of arguments and perspectives aired over that time, but the problem of long-term access to software and to software-dependent cultural heritage was absent from the conversation.

More fundamental concerns occupied center stage, as combatants argued over the existential question of whether copyright’s utilitarian, economic justification applied to software, i.e., whether such protection would generally encourage, rather than discourage, the creation and publication of new software. The CONTU Report in the U.S.<sup>40</sup> as well as reports prepared for the governments in the U.K.<sup>41</sup> and Australia,<sup>42</sup> and for the international body WIPO<sup>43</sup>—all took the position that copyright was appropriate for software in part because in the absence of IP protection software was threatened by the same underinvestment problem as other kinds of IP subject matter. To wit: developing a software product takes substantial time and effort, but copying technology makes it relatively easy for competitors to make and sell copies of the same software without

<sup>37</sup> See *supra* n. 34-35 and accompanying text.

<sup>38</sup> See, e.g., 42matters, *iOS Apple App Store Statistics and Trends 2025* (April 5, 2025), <https://42matters.com/ios-apple-app-store-statistics-and-trends> (1.9 million apps available on the Apple iOS App store, 1,632 apps published per day).

<sup>39</sup> See generally Part III below.

<sup>40</sup> Nat’l Commission On New Tech. Uses of Copyrighted Works, Final Report (1979) [hereinafter cited as CONTU FINAL REPORT].

<sup>41</sup> *Copyright and Designs Law: Report of the Comm. to Consider the Law on Copyright and Designs* (H.M.S.O., 1976) (frequently known as the Whitford Committee Report).

<sup>42</sup> Commonwealth of Austl. Copyright L. Rev. Comm., *Computer Software Protection* 30-31 (1995)

<sup>43</sup> Michael S. Keplinger, *Legal Protection For Computer Programs: A Survey And Analysis Of National Legislation And Case Law* (1984) (commissioned for WIPO by the UNESCO Secretariat). Note, however, that an earlier report commissioned for WIPO concluded that *sui generis* protection for computer programs was more appropriate than copyright. Model provisions on the protection of computer software, (World Intellectual Property Organization ed., 1978).

undertaking the effort to develop it. Without confidence they could recoup their investment, would-be creators will underinvest in software, slowing innovation and reducing consumer choice.

As early as 1970, critics of this argument, most notably future U.S. Supreme Court Justice Stephen Breyer, noted the various ways that software innovators could be assured of a reasonable profit from their efforts without copyright.<sup>44</sup> Breyer raised lead-time advantage, the sale of related products and services, and other mechanisms to argue that software developers would still have ample financial incentive to innovate in the absence of copyright protection.<sup>45</sup> In addition to the lack of necessity for copyright, critics also warned of harms to the public interest associated with copyright, chiefly the potential reduction in access to protected works, and the suppression of competition in the market for software.<sup>46</sup> These critics never expressly raised the implications of copyright protection for long-term research and scholarly access to software or the potential loss of access to software-dependent digital works, but of course, these modes of access are adversely impacted by overprotection just as surely as competitive and consumer uses.

Another critique of software copyright was broader and more theoretical, arguing that software is not the right kind of work to receive copyright protection, either under the US Constitution or under general principles of copyright law. These critics (including the CONTU dissent of Prof. Hersey,<sup>47</sup> the concurring opinion of CONTU commissioner Raymond Nimmer,<sup>48</sup> and a line of scholarship by Pamela Samuelson,<sup>49</sup> among others) argue that software, especially in its machine-readable object code form, is inappropriate subject matter for copyright due to its functional nature, its failure to communicate an expressive message to humans, the possibility of "publishing" software in machine-readable form without disclosing the underlying literary work (the source code), and other related qualities. Critics argued these characteristics take software out of the "writings of authors" category in the US Constitution, and more generally out of the realm of expressive, creative works that copyright is meant to protect, placing it instead in the realm of functional creations, inventions, and discoveries. Either patent protection

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<sup>44</sup> Stephen Breyer, *The Uneasy Case For Copyright: A Study Of Copyright In Books, Photocopies, And Computer Programs*, 84 HARV. L. REV. 281 (1970).

<sup>45</sup> *Id.*

<sup>46</sup> Pamela Samuelson, *CONTU Revisited: The Case against Copyright Protection for Computer Programs in Machine-Readable Form*, 1984 DUKE. L. J. 663 (1984); Dennis S Karjala, *COPYRIGHT, COMPUTER SOFTWARE, AND THE NEW PROTECTIONISM*, 28 JURIM. J. 33 (1987); Randall Davis, *Intellectual property and software: The assumptions are broken, in Proceedings of WIPO's Worldwide Symposium on Legal Aspects of Artificial Intelligence*, Stanford Univ. (Mar. 1991); Pamela Samuelson, Randall Davis, Mitchell D. Kapur, & J.H. Reichman, *A Manifesto Concerning the Legal Protection of Computer Programs*, 94 COLUM. L. REV. 2308 (1994)[hereinafter *Software Manifesto*].

<sup>47</sup> CONTU Final Report at 27 ff.

<sup>48</sup> *Id.* at 26.

<sup>49</sup> See, e.g., Samuelson, *CONTU Revisited*, *supra* n. 46.; Samuelson, *Creating a New Kind of Intellectual Property: Applying the Lessons of the Chip Law to Computer Programs*, 63 MINN. L. REV. 70 (1986); Samuelson, *Modifying Copyrighted Software: Adjusting Copyright Doctrine to Accommodate a Technology*, 28 JURIM. J. 179 (1988); Samuelson, "A Case Study on Computer Programs" in *Global Dimensions of Intellectual Property Rights in Science and Technology* (1993), <https://doi.org/10.17226/2054>.

or a *sui generis* form of protection would be preferable to copyright for software, as they could feature shorter terms and higher barriers to protection, which would enable more competition and innovation in the market for software.<sup>50</sup>

Here again, the harms explicitly foreseen by software copyright critics related exclusively to lack of competition in the software market (the potential chilling effect of copyright on competing software developers, the potential for undue market power and needlessly higher prices that could result from over-protection), but the principles and arguments they invoked apply comfortably to cultural preservation, as well. While this focus on effects within the market for software is natural for critics that take an economic perspective, it may have left them fighting an uphill battle on territory that has proven to be friendlier to protectionists (witness the one-way ratchet of copyright scope and term expansion generally).

As software copyright matured, the debate turned from whether software should be protected by copyright to the proper scope of this protection. Courts<sup>51</sup> and scholars<sup>52</sup> wrestled with whether copyright protected the so-called "sequence, structure, and organization" (or SSO) of a software program, and whether copyright protects "interfaces" or the "look and feel" of a program. Litigation over these issues involved competitors in the software market, and again, the stakes were defined in terms of the potential for undue market power and distortion in the software marketplace. The question of long-term effects of copyright on access to software-dependent creative works continued to be too abstract to attract the interest of scholars or litigators.

Skeptics of software copyright praised the resolution of these controversies in the "abstraction, filtration, comparison" test enshrined in the *Altai* case,<sup>53</sup> as this new test seemed likely to enable healthier competition in the software marketplace by limiting the scope of copyright in a particular program. After *Altai* and related cases on the issue of software interfaces and compatibility, it seemed the path had largely been cleared for software innovators.<sup>54</sup>

Similarly, a line of promising fair use decisions in the software realm gave skeptics something to cheer. Cases protecting reverse engineering<sup>55</sup> and the creation of

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<sup>50</sup> See generally Software Manifesto.

<sup>51</sup> *Whelan Associates, Inc. v. Jaslow Dental Lab'y, Inc.*, 797 F.2d 1222 (3rd Cir. 1986); *Lotus Dev. Corp. v. Borland Int'l., Inc.*, 49 F.3d 807 (1st Cir. 1995).

<sup>52</sup> See, e.g., Susan Dunn, *Defining the Scope of Copyright Protection for Computer Software*, 38 STAN. L. REV. 497 (1986); Peter S. Menell, *An Analysis of the Scope of Copyright Protection for Application Programs*, 41 STAN. L. REV. 1045 (1989); Pamela Samuelson, *Functionality and Expression in Computer Programs: Refining the Tests for Software Copyright Infringement*, 31 BERKELEY TECH. L.J. 1215 (2017).

<sup>53</sup> *Computer Assocs. Int'l, Inc. v. Altai, Inc.*, 982 F.2d 693 (2d Cir. 1992).

<sup>54</sup> For an excellent summary of the software interface battles and their resolution, see Jonathan Band & M. Katoh, *Interfaces on Trial: Intellectual Property and Interoperability in the Global Software Industry* (1996). Band has written two sequels summarizing developments in software law since 1996: Jonathan Band & M Katoh, *Interfaces on Trial 2.0* (2011), <https://mitpress.mit.edu/9780262538640/interfaces-on-trial-2-0/> (last visited Sep 11, 2023); Jonathan Band, *Interfaces On Trial 3.0* (2021).

<sup>55</sup> *Sega v. Accolade*, 977 F.2d 1510 (9th Cir. 1992); *Sony Computer Ent. v. Connectix Corp.*, 203 F.3d 596 (9th Cir. 2000).

complementary products<sup>56</sup> again seemed to clear the way for increased innovation by competing software firms. The copyright monopoly over software was beginning to shrink to the point that Dennis Karjala had argued for in 1987: a protection against wholesale piracy, but perhaps not too much more.<sup>57</sup>

On their face, none of these developments holds out much promise for librarians and archivists who need to engage in literal copying of entire programs to facilitate preservation of and access to both the programs themselves and dependent digital files. Nevertheless, each of these cases includes helpful dicta regarding the importance of limiting copyright in software to avoid excess market power.<sup>58</sup> The game-changing moment would have to wait until 2021, however, when the Supreme Court took its first-ever case regarding software copyright: *Google v. Oracle*, discussed at greater length in Part III.

### *B. Software copyright, the digital dark age, and the interests of authors*

Although the software copyright skeptics did not foresee the digital dark age, the threat it poses is consistent with their argument that software is fundamentally a functional, technological creation. To see how, consider the indistinguishable roles of software and hardware in the dark age scenario. Both hardware and software are *tools* without which digital records (including software programs themselves...) cannot be faithfully interpreted or rendered. Indeed, theoretically any function that can be performed by software could be encoded into hardware instead, a fact that Samuelson invokes in her argument that software is a machine constructed from text.<sup>59</sup> In the language of the Copyright Act, software will be a necessary part of any “machine or device” used to render a “copy” of a work stored in a digital format.<sup>60</sup> Much software derives its value from its *utility* in performing tasks. Essential to our concerns here, software for creating and rendering digital media is valuable because it faithfully renders a digital document according to its creator’s intent. This is the same value contributed by a particular disk drive, processor chip, or monitor.

Similarly, Karjala describes computer software as “the technology for using computers,” and explains at length the parallels between software engineering and other forms of technological engineering, like bridge building.<sup>61</sup> In arguing against the full application of copyright to software, Karjala invokes several copyright doctrines that

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<sup>56</sup> *Lewis Galoob Toys, Inc. v. Nintendo of Am., Inc.*, 964 F.2d 965 (9th Cir. 1992).

<sup>57</sup> See Karjala, *supra* n. 46.

<sup>58</sup> See *Sega*, 977 F. 2d at 1523-24 (“an attempt to monopolize the market by making it impossible for others to compete runs counter to the statutory purpose of promoting creative expression and cannot constitute a strong equitable basis for resisting the invocation of the fair use doctrine”); *Sony*, 208 F.3d at 607 (“Sony understandably seeks control over the market for devices that play games Sony produces or licenses. The copyright law, however, does not confer such a monopoly.”).

<sup>59</sup> See Samuelson, *CONTU Revisited...*, *supra* n. 46.

<sup>60</sup> See 17 USC § 101, defining “copies” as “material objects...in which a work is fixed by any method now known or later developed, and from which the work can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device.”

<sup>61</sup> Karjala, *supra* n. 46 at 38.

traditionally limit copyright's application to useful aspects of copyrightable works.<sup>62</sup> One is technological standardization, which Karjala describes as the development of "interlocking parts whose form and design are only partially determined by function," giving as an example the matching size and shape of a light socket and a bulb.<sup>63</sup> An infinite number of arbitrary shapes would work (so the design is not dictated by its function), nevertheless, it would be bad policy to grant copyright protection to these designs.<sup>64</sup> This is because, "the first fixture manufacturer to gain widespread public acceptance would have a long-term semi-monopoly on light bulbs, and the public would suffer the inconvenience that results from non-interchangeability as other manufacturers attempted to compete by introducing their own proprietary designs."<sup>65</sup> Karjala concludes that, "traditional copyright law denies protection no matter how arbitrary or original the purported work, where recognition of copyright could create a de facto monopoly over nonpatented useful products of which the work is an indispensable part."<sup>66</sup>

The problem posed by software copyright in the context of the digital dark age scenario is analogous. When a particular software tool is adopted as a standard tool—Microsoft Word for writers, AutoCAD for architects, ProTools for music recording and production, Microsoft Excel for bookkeeping, etc.—the proprietor of these tools has a de facto monopoly on access to the documents that depend on them—the documents are inaccessible without the relevant software. Because the software market is focused on current and future products rather than on legacy content, no one is abusing this monopoly (yet) to overcharge research institutions for access to obsolete software. Instead, the market failure here is that the specter of copyright hangs like a cloud over the use of these programs and, by extension, over access to the entire corpus of works created using them.

When expressive works are software dependent, an ironic twist emerges: rather than creating a semi-monopoly on other functional items (control of the light bulb market, in Karjala's analogy), software copyright creates a semi-monopoly on *others' expressive works*. So far, I've characterized this dysfunction as primarily a problem for research and research institutions, but of course, most authors want their work to endure.<sup>67</sup> Authors and researchers are in a symbiotic relationship in that sense—authors want to be read, and researchers want to read. Both are harmed when works become inaccessible. Applying the logic of protectionism and author's rights to software has led to a perverse situation that is harmful to copyright's core constituencies (authors and readers) as well as its core purpose.

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<sup>62</sup> *Id.*

<sup>63</sup> *Id.* at 43

<sup>64</sup> *Id.*

<sup>65</sup> *Id.*

<sup>66</sup> *Id.* at 44.

<sup>67</sup> See, e.g., William Shakespeare, *Sonnet 18* ("So long as men can breathe or eyes can see, So long lives this, and this gives life to thee."); c.f. Neil Young, "My My, Hey Hey (*Out of the Blue*)" *Rust Never Sleeps* (1979) ("It's better to burn out than to fade away.")

### C. Digital copyright, abundance, and the digital dark ages

From the earliest days of the era of digital computers and networks, it was well understood that these technologies promised an era of abundance.<sup>68</sup> Sharing perfect digital copies instantly across a global network would be so easy that stopping it would be either grossly immoral or an existential moral imperative, depending on whom you asked.

Everyone agreed, in other words, that the advent of digital technology promised abundance, and the main question was whether the exclusive rights in the copyright system should get stronger to bring that abundance more under rightsholder control or weaker to give way to the freewheeling nature of the emerging digitally networked public square. The threats to digital abundance were piracy (for the protectionists) or protectionism (for the skeptics).<sup>69</sup> Protectionists told us that stronger copyright would give professional creators the incentive to feed digital abundance and reap a fair reward for their efforts.<sup>70</sup> Skeptics told us that weaker copyright would give everyone the freedom to share, remix, and engage with culture in ways that were already creating vast online “libraries” and communities that didn’t pose a threat to creators’ profit motive.<sup>71</sup> Compromises like the Digital Millennium Copyright Act of 1998 have tried to steer a middle path, granting rightsholders new forms of control over their works while giving digital services breathing room to foster online spaces that are open to all.

The intervening decades give some cause for optimism about digital abundance. Take sound recordings as an example: digital streaming services are bringing the recording industry unprecedented new levels of profitability<sup>72</sup> and offering consumers

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<sup>68</sup> Benjamin Kaplan’s wonderful book *An Unhurried View of Copyright*, which compiles a series of lectures he gave in 1966, includes a startlingly prescient “bedtime story” describing “linked or integrated systems or networks of computers capable of storing faithful simulacra of the entire treasure of the accumulated knowledge and artistic production of past ages, and of taking into the store new intelligence of all sorts as produced.”

<sup>69</sup> On the threat of piracy, see NII White Paper, *supra* n. 3 at 177 (“If content providers cannot be assured that they will be able to realize a commercial gain from the sale and use of their products using the [internet], they will have little incentive to use it.”). On the threat of protectionism, see John Perry Barlow, *A Declaration of the Independence of Cyberspace*, *ELECTRONIC FRONTIER FOUNDATION*, <https://www.eff.org/cyberspace-independence> (Feb. 8, 1996) (“Your increasingly obsolete information industries would perpetuate themselves by proposing laws, in America and elsewhere, that claim to own speech itself throughout the world.... In our world, whatever the human mind may create can be reproduced and distributed infinitely at no cost. The global conveyance of thought no longer requires your factories to accomplish.”).

<sup>70</sup> See, e.g., Copyright Alliance, *Online Copyright Infringement*, <https://copyrightalliance.org/policy/position-papers/online-copyright-infringement/> (last visited April 6, 2025) (“It is essential that the copyright industries be able to recoup their investments in creative works to fund the next wave of investment, create and distribute quality content for the public to enjoy, and support the livelihoods of the millions of individuals these industries employ in the United States.”)

<sup>71</sup> See, e.g., LAWRENCE LESSIG, *FREE CULTURE* 54 (2004) (peer-to-peer filesharing is sufficiently beneficial that we should “find a way to protect artists while enabling this sharing to survive.”)

<sup>72</sup> See Mulligan, *supra* n. 19; RIAA, *100 Million Paid Subscriptions Milestone Drives US Recorded Music*, <https://www.riaa.com/2024-year-end-music-industry-revenue-report-riaa/> (Mar. 18, 2025)

unprecedented access to huge catalogs of music—an apparent win-win for digital abundance. Moving up the chain from distribution to creation, digital technology has made recording music and other audio cheaper, easier, and more accessible than ever before. Almost all music is recorded with digital multi-track recording software, which puts more recording capability in the hands of a teenager with an iPad than was at the disposal of The Beatles at the height of their studio-as-instrument powers.<sup>73</sup> All this abundance can have a perverse effect on the value of any particular recording, of course, but as long as creators still have adequate incentives to create, the advent of cheaper consumer access to more music looks like a win for copyright policy.

But as Part I showed, while digital media may be fast, cheap, and easy to make and share—abundant—as time passes, digital media is the most fragile, ephemeral, and ultimately scarce form of cultural record-making yet devised by humankind.<sup>74</sup> The best hope for sound recordings on streaming platforms to be preserved in the long term is if they are released outside of these digital walled gardens and find their way into the research collections that will preserve and make them accessible without regard to commercial demand. Looking beyond the published historic record to the archival one, the master recordings of contemporary music may be in worse shape. These original recordings, of immense historical value, will only be accessible to people and institutions that can run the complex (but inevitably obsolete) software tools with which they were created (not to mention the software environment on which it depends, and the hardware or emulated hardware on which that software environment runs, and on and on).<sup>75</sup>

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(“The full RIAA 2024 Year-End Revenue Report reflects sustained and continued growth in recorded music, now valued at \$17.7billion retail and \$11.3 billion wholesale.”).

<sup>73</sup> *Build a Song in Garageband for iPad*, Apple,

<https://support.apple.com/en-hk/guide/garageband-ipad/chsb34b9757/ipados> (last visited April 6, 2025) (“A GarageBand song can have up to 32 tracks and be up to 2000 bars long.”); *Recording practices of the Beatles*, Wikipedia,

[https://en.wikipedia.org/wiki/Recording\\_practices\\_of\\_the\\_Beatles](https://en.wikipedia.org/wiki/Recording_practices_of_the_Beatles) (describing the use of 4-track and 8-track tape machines, albeit with “bounce down” tricks to multiply tracks).

<sup>74</sup> See generally Part I.

<sup>75</sup> See Daniel Finn, *Out of the Darkness: Preserving the Digital Output of Independent Punk and Metal Labels* 18,

[https://miapnyu.org/program/student\\_work/2014spring/14s\\_3490\\_finn\\_thesis\\_v.pdf#page=2.09](https://miapnyu.org/program/student_work/2014spring/14s_3490_finn_thesis_v.pdf#page=2.09) (2014) (describing a studio engineer whose archive of ProTools session files from his own career cannot be played on the latest version of the software).

### III. SAVING SOFTWARE (AND EVERYTHING ELSE) TOGETHER<sup>76</sup>

Hardware obsolescence and related technical issues have been a key barrier to stewardship of software and other digital media for decades.<sup>77</sup> For just as long, emulation technology has held out the promise of continuing access to hardware-dependent files *without* specific hardware.<sup>78</sup> Video game enthusiasts have led the way in developing emulators that can run game software originally developed for long-dead gaming consoles like the Atari 2600 on modern PC hardware.<sup>79</sup> The latest evolution of emulation technology seems capable of fulfilling the technology's promise at scale and across platforms, dramatically lowering barriers to research access not only on-site at a research institution's facility but also in a remote researcher's web browser. Technologists in research libraries around the world are working collaboratively to develop this approach to emulation, which could reduce, if not eliminate, the threat to access posed by hardware obsolescence.<sup>80</sup> The leading effort along these lines in the United States is the EaaSI Project.<sup>81</sup>

These advanced emulation-as-a-service technologies may reduce or eliminate our dependence on specific hardware, but they still require lawful access to software, including operating systems, drivers, plug-ins, and other utilities as well as the software applications used to render digital documents. These uses implicate copyright in a variety of ways, as the software must be copied into preservation storage environments, may require adaptation in connection with running them in the novel emulated context, and are then arguably publicly displayed or performed<sup>82</sup> when made available to researchers. Digital rights management (encryption, authentication servers, dongles) may have to be circumvented.<sup>83</sup>

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<sup>76</sup> "Saving software together" is the official mission of the Software Preservation Network (SPN), a group of institutions and individuals dedicated to ensuring long-term preservation and access to software that comprises a crucial part of our shared cultural heritage. SOFTWARE PRESERVATION NETWORK, <https://www.softwarepreservationnetwork.org> (last visited \_\_\_\_). Many of the ideas and issues developed in this paper are a result of my conversations and collaborations with SPN's organizers and members, and since 2017 I have worked for SPN as its Law and Policy Advisor. The SPN community is administered by the Educopia Institute, <https://educopia.org>.

<sup>77</sup> See PDI Task Force Report at 5 ("[T]echnological obsolescence represents a far greater threat to information in digital form than the inherent physical fragility of many digital media").

<sup>78</sup> *Id.* at 29, suggesting "processing centers" equipped with an arsenal of emulators could be hubs of support for long term access to digital files.

<sup>79</sup> *List of video game emulators*, WIKIPEDIA

[https://en.wikipedia.org/wiki/List\\_of\\_video\\_game\\_console\\_emulators](https://en.wikipedia.org/wiki/List_of_video_game_console_emulators) (Apr. 4, 2025).

<sup>80</sup> See generally, Euan Cochrane, Jonathan Tilbury & Oleg Stobbe, *Adding emulation functionality to existing digital preservation infrastructure*, 6 J. DIGIT. MEDIA MGMT. 255 (2018).

<sup>81</sup> See generally, EaaSI,

<https://www.softwarepreservationnetwork.org/emulation-as-a-service-infrastructure/> (last visited December 7, 2023).

<sup>82</sup> See, e.g., *Columbia Pictures Indus., Inc. v. Redd Home, Inc.*, 749 F.2d 154 (3rd Cir. 1984) ('private' viewing booths rented to customers at video store constitute "public performance" under 17 U.S.C. § 101).

<sup>83</sup> See KENDRA ALBERT & KEE YOUNG LEE, *A PRESERVATIONIST'S GUIDE TO THE DMCA EXEMPTION FOR SOFTWARE PRESERVATION* (2d ed. 2022), available at

To accommodate these practices, researchers and research institutions will need to take advantage of limitations and exceptions to copyright that may not be as familiar to them (although they rely on them every day<sup>84</sup>), or that they may not have applied in this context before. This Part will explore the prospects for this approach in the US, focusing on two key judicial opinions that point the way forward based on fair use, favorable decisions in the U.S. Copyright Office's triennial DMCA Rulemakings, and a code of best practices in fair use developed by professionals who best understand how software preservation serves the kinds of new and important social purposes favored by fair use.

#### A. *Fair Use and Google v. Oracle*<sup>85</sup>

On April 5, 2021, the Supreme Court issued its opinion in the long-running litigation between Oracle and Google over the reuse of aspects of Oracle's Java programming framework in Google's Android mobile operating system.<sup>86</sup> The majority opinion, written by Justice Breyer and joined by Chief Justice Roberts and Justices Kagan, Sotomayor, Kavanaugh, and Gorsuch, sided with Google, saying its use was lawful because it was protected by fair use.<sup>87</sup> Justice Thomas wrote a dissent, joined only by Justice Alito.<sup>88</sup> The newest Justice, Amy Coney Barrett, did not participate in the arguments or decision of the case as it predated her joining the Court.<sup>89</sup>

Justice Breyer's opinion is a landmark: it was the first Supreme Court opinion to address fair use in nearly thirty years—the last one was *Campbell v. Acuff-Rose* in 1994.<sup>90</sup> And it is the first Supreme Court opinion to address copyright's protection for software—ever. The opinion will be a milestone for another reason: it is a confident, erudite treatment of the issue by a Justice who has been thinking about copyright and software for more than half a century. As a law professor, Stephen Breyer earned tenure at Harvard based on his 1970 article, "The Uneasy Case for Copyright: A Study of Copyright in Books, Photocopies, and Computer Programs."<sup>91</sup> The opinion is thus a very

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[https://www.softwarepreservationnetwork.org/wp-content/uploads/2020/02/1201-Preservationists-Guide-to-DMCA-Exemption\\_11182022.pdf](https://www.softwarepreservationnetwork.org/wp-content/uploads/2020/02/1201-Preservationists-Guide-to-DMCA-Exemption_11182022.pdf).

<sup>84</sup> See, e.g., *Fair Use in a Day in the Life of a College Student (Infographic)*, ASS'N OF RSCH. LIBR., <https://fairuseweek.org/wp-content/uploads/2016/02/fair-use-in-a-day-in-the-life-of-a-college-student-infographic-feb2016.pdf> (last visited Jan. 18, 2024).

<sup>85</sup> Adapted from Butler, *Google v. Oracle: Takeaways for Software Preservation, Cultural Heritage, and Fair Use Generally*, SOFTWARE PRESERVATION NETWORK, <https://www.softwarepreservationnetwork.org/google-v-oracle-takeaways-for-software-preservation-cultural-heritage-and-fair-use-generally-2021-reflection/> (2021)

<sup>86</sup> *Google LLC v. Oracle America, Inc.*, 141 S. Ct. 1183 (2021).

<sup>87</sup> *Id.*

<sup>88</sup> *Id.* at 1210.

<sup>89</sup> More background on the case can be found in my blog post for SPN summarizing the oral arguments. Brandon Butler, *Google v. Oracle Oral Argument: Quick Takeaways for Software Preservation (2020)*,

<https://www.softwarepreservationnetwork.org/google-v-oracle-oral-argument-quick-takeaways-for-software-preservation/> (last visited Apr. 6, 2025).

<sup>90</sup> *Campbell v. Acuff-Rose Music, Inc.*, 510 U.S. 569 (1994).

<sup>91</sup> See Danny Freedman, *Revisiting the Easy Case*, GW TODAY, <https://gwtoday.gwu.edu/revisiting-uneasy-case> (Nov. 8, 2010).

happy coincidence: a thorny and consequential issue confronted by a subtle and experienced thinker. And crucially, the results are encouraging for software preservation and for cultural heritage institutions and fair users generally.

This case is *not* just about reimplementing APIs. Copyright industry groups issued statements attempting to minimize the *Oracle* opinion and characterize it as limited to the narrow context of this case (the reimplementation of API interface elements, to state it as narrowly as possible).<sup>92</sup> While Justice Breyer says that his opinion is not intended to “overturn or modify” the court’s previous fair use rulings, he also says that the court has reached its opinion by applying general fair use principles.<sup>93</sup> In doing so, the Court necessarily elucidates these principles and gives new insight into how they could apply to future cases, especially future software cases. So, while this is a case about reimplementing an API, it is not *just* a case about that.

Fair use applies equally to software (as do all the other limitations and exceptions in copyright). The majority opinion assumes that the code at issue is protected (a question that was raised in the case, but that the court chose not to settle), but promptly reminds us that while “owners of computer programs enjoy the exclusive rights” in the Copyright Act, those rights “are limited like any other works” by the limitations and exceptions in the law.<sup>94</sup> In particular, “[j]ust as fair use distinguishes among books and films, which are indisputably subjects of copyright, so too must it draw lines among computer programs.”<sup>95</sup> Recognizing copyright’s limitations as well as its exclusive rights is a key part of remaining “faithful to the Copyright Act’s overall design.”<sup>96</sup> It may seem banal, but this observation is important because there are plenty of critics who would argue (as Justice Thomas arguably does in his dissent) that copyright protection for software is not subject to the limits that apply to other kinds of works.<sup>97</sup>

Justice Breyer explains why fair use is *especially* important for software. He begins by quoting approvingly the observation that “applying copyright law to computer programs is like assembling a jigsaw puzzle whose pieces do not quite fit,” because computer programs have a strong functional aspect unlike anything found in books, film scripts, and other “literary works” protected by copyright.<sup>98</sup> The law treats functional things with more suspicion in terms of granting monopolies—they typically must go through the more expensive and onerous patent process, and the monopoly that results is much shorter, so that useful discoveries can pass more quickly into unfettered public use.<sup>99</sup> The CONTU Report noted that the commission was “Mindful of not ‘unduly burdening users of programs and the general public,’ [and] wrote that copyright ‘should

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<sup>92</sup> Copyright Alliance CEO Issues Statement on Supreme Court Ruling in *Google v. Oracle*, <https://copyrightalliance.org/press-releases/supreme-court-ruling-in-google-v-oracle-statement/> (Apr. 6, 2021).

<sup>93</sup> *Google*, 141 S. Ct. at 1208.

<sup>94</sup> *Google*, 141 S. Ct. at 1199.

<sup>95</sup> *Id.*

<sup>96</sup> *Id.*

<sup>97</sup> *Id.* at 1199.

<sup>98</sup> *Id.* at 1198, quoting *Lotus Dev. Corp. v. Borland Int'l, Inc.*, 49 F.3d 807, 820 (C.A.1 1995) (BOUDIN, J., concurring).

<sup>99</sup> See generally Pamela Samuelson, *Why copyright law excludes systems and processes from the scope of its protection*, 85 TEX. L. REV. 1921 (2006).

not grant anyone more economic power than is necessary to achieve the incentive to create.”<sup>100</sup>

With this policy objective in mind, Justice Breyer argues that fair use has a crucial role to play in keeping software copyright in balance:

The upshot, in our view, is that fair use can play an important role in determining the lawful scope of a computer program copyright, such as the copyright at issue here.... It can focus on the legitimate need to provide incentives to produce copyrighted material while examining the extent to which yet further protection creates unrelated or illegitimate harms in other markets or to the development of other products. In a word, it can carry out its basic purpose of **providing a context-based check that can help to keep a copyright monopoly within its lawful bounds.** [emphasis added]<sup>101</sup>

Thanks to Justice Breyer’s opinion, it is much easier now to explain why software reuse for preservation, teaching, and research is transformative. In deciding whether a use is fair, courts (very) strongly favor uses that are found to be “transformative,” a legal term of art that describes uses “at the heart”<sup>102</sup> of fair use’s protection because they advance copyright’s Constitutional purpose.<sup>103</sup> In Justice Breyer’s words, a transformative use does something “important and new” relative to the original work used. Sometimes this involves literally changing the work into something different (as in a parody song that uses the original melody but new lyrics that mock the original), but just as often a work is used unchanged but for a new purpose (as in the creation of a search database and display of thumbnail search results for images on the internet).

Deciding whether a use is “new” can depend on how the nature and the purpose of the use is characterized. In this case, Google’s use can be described in a way that makes it sound hardly new at all. As Justice Breyer writes, “Google copied portions of the Sun Java API precisely, and it did so in part for the same reason that Sun created those portions, namely, to enable programmers to call up implementing programs that would accomplish particular tasks.” Nevertheless, Justice Breyer warns that “since virtually any unauthorized use of a copyrighted computer program (say, for teaching or research) would do the same, to stop here would severely limit the scope of fair use in the functional context of computer programs.”

Two remarkable and important things happen in this one sentence. First, it’s clear that severely limiting the scope of fair use is not an acceptable outcome. Others (like Justice Thomas in dissent) might be perfectly comfortable with that outcome, but the majority makes clear that such a miserly approach is not tenable under the law. If an interpretation of transformative use puts fair use out of reach in most software cases, Breyer says, then that interpretation is wrong.

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<sup>100</sup> *Google*, 141 S. Ct. at 1198.

<sup>101</sup> *Id.*

<sup>102</sup> *Campbell*, 510 U.S. at 579.

<sup>103</sup> Empirical analysis of the fair use case law has shown the ascendancy of transformative use in the years following *Campbell*. See Barton Beebe, *An Empirical Study of US Copyright Fair Use Opinions, 1978-2005*, 156 U. Pa. L. Rev. 549 (2007); Neil Weinstock Netanel, *Making Sense of Fair Use*, 15 LEWIS & CLARK L. REV. 1 (2011); Clark D. Asay et al., *Is Transformative Use Eating the World?*, 61 BOSTON COL. L. REV. 905 (2020).

Second, Justice Breyer calls out “teaching and research” as core fair use purposes that had better not be severely limited by an overly simplistic analysis of transformative use. That is, the fact that a narrow, literal reading of transformative use would chill teaching and research is itself a reason to reject that reading. To avoid this outcome, “we must go further and examine the copying’s more specifically described ‘purpose[s]’ and ‘character.’”<sup>104</sup>

To go further, Justice Breyer explains that Google’s Android platform for smartphone app developers was a new and important product that incorporated Java code only insofar as it was needed to ease the way for developers moving to the new platform.<sup>105</sup> He quotes from amicus briefs and refers to the trial record evidence showing that reusing code in this particular context (reusing declaring code) without permission is a normal way of creating new products, is necessary for interoperability, is necessary to enable programmers to use their skills (including familiarity with Java API calls), and is widely believed to be a salutary aspect of software creation, which is in turn supportive of the Constitutional purpose of copyright – to “promote Progress.”<sup>106</sup>

The upshot of all this for software preservation and scholarly access is that it creates a clear pathway for practitioners to explain why their uses are transformative, and to push back against overly simplistic characterizations that would eviscerate fair use. Consider, for example, an institution that makes software in its collection available to scholars in an emulated environment so that researchers can access archival material stored in proprietary file formats. One characterization of that use is that the software is being copied and made accessible for the very same reason it was originally created—to open and read/manipulate files. But Justice Breyer has warned us against such a simple, generic characterization, and urged us to go further and look more closely in order to ensure we preserve breathing space for fair use—especially for teaching and research.

Accordingly, we can more specifically describe the nature and purpose(s) of software reuse in a research setting to show how it is fundamentally different from ordinary consumer use: it ensures continuing access to historic material for scholarly reference and teaching, furthering the development of scholarship about archival materials (including software itself), enabling scholars and teachers to use their acquired skills (familiarity with archival materials), and ultimately promoting progress. Just like Google’s reimplementation of Java code, cultural heritage institutions’ reuse of old software in research-oriented emulation environments enables a “new collection of tasks”—in this case research and teaching tasks—operating in a “distinct and different computing environment,” i.e., in an emulated environment on modern, networked hardware.

Another useful aspect of *Google* is its explanation of why it is fair to copy entire software works if it’s appropriate to your valid, transformative purpose. This is not a new principle, but it is reaffirmed in Justice Breyer’s discussion of the third factor: amount and substantiality of the work used.<sup>107</sup> It is a common misconception that the third fair use factor—amount—is a simple sliding scale, and that the greater the amount or substantiality of your use, the less the law will favor you. In fact, fair use protects a wide

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<sup>104</sup> *Google*, 141 S. Ct. at 1203.

<sup>105</sup> *Id.*

<sup>106</sup> U.S. Const. art. 1, § 8.

<sup>107</sup> *Google*, 141 S. Ct. at 1204 ff.

variety of uses, including uses of entire works. How can this be? As Justice Breyer explains, quoting from *Campbell v. Acuff-Rose*, “the extent of permissible copying varies with the purpose and character of the use.”<sup>108</sup> Since transformative purposes are strongly favored by fair use, “The ‘substantiality’ factor will generally weigh in favor of fair use where, as here, the amount of copying was tethered to a valid, and transformative, purpose.”<sup>109</sup>

For software preservation, the appropriate amount for preservation purposes is almost always the entire work. Similarly, research and teaching uses will typically require access to entire works (though that access can be limited and tailored as appropriate, and time-limited, so providing emulated access is arguably modest compared to providing a copy). The old “less is better, more is worse” myth can make people nervous about this, but Justice Breyer’s opinion here should help give institutions and individuals confidence to use the amount appropriate to their purpose, up to and including entire works.

The final factor in the fair use statute is the effect of the new use on the market for the work, and Justice Breyer’s approach to this factor opens interesting doors for software preservation. Justice Breyer considers three sub-factors:

1. The amount of revenue a rights holder stands to lose from a use (including widespread similar uses by others).
2. The source of the loss (i.e., why will the use cause revenue loss, if any).
3. The public benefits of the use and their importance relative to the amount of revenue loss.

In considering these, the court finds that each one favors Google—and parallel arguments could be made regarding software preservation.

First, looking at evidence from the trial, Justice Breyer concludes that the jury could reasonably have concluded that Google’s use did not cause any revenue loss for Oracle.<sup>110</sup> This is because Sun/Oracle was “poorly positioned to succeed” in the new smartphone market that Google developed with Android.<sup>111</sup> Accordingly, Google’s use of Java did not unfairly compete with Java in that market, or displace it from the market.

Similarly, software vendors generally are not positioned to support research use of out-of-commerce software (especially software that cannot be run on contemporary hardware). They are focused on developing, marketing, and supporting products for the consumer market and contemporary hardware. Indeed, part of their strategy in this process is to replace old products with new ones, encouraging users to upgrade or switch by enticing them with new features, compatibility with the latest hardware, etc., and eventually ending support for older versions. Preservation and research access are no threat to the vendors’ consumer market, but serve only the “new” market for research access, which the vendors (like Oracle) cannot support. Hence, preservation and research uses cause no cognizable lost revenue for software vendors.

Although Sun/Oracle couldn’t have competed with Google in the smartphone market, perhaps they could have profited by demanding a license from Google for use of Java. What is the nature of this lost revenue – i.e., is it akin to revenue lost due to

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<sup>108</sup> *Id.* at 1205.

<sup>109</sup> *Id.*

<sup>110</sup> *Id.* at 1206.

<sup>111</sup> *Id.*

substitution (which weighs against fair use), or is it more like revenue lost due to a negative review (which does not)? The core policy insight that fuels Justice Breyer's opinion is that the main source of value for Java's API elements is the time and effort that developers have invested in learning to use them.<sup>112</sup> In oral arguments, Justice Breyer compared the API to the QWERTY keyboard layout—it's not an inherently valuable or useful system, but once enough users have learned it and come to rely on it, it's extremely valuable and important that future keyboards/development frameworks include it.<sup>113</sup> So, Justice Breyer concludes, "This source of Android's profitability has much to do with third parties' (say, programmers') investment in Sun Java programs. It has correspondingly less to do with Sun's investment in creating the Sun Java API. We have no reason to believe that the Copyright Act seeks to protect third parties' investment in learning how to operate a created work."<sup>114</sup>

Institutions engaged in software preservation find themselves in much the same position as Google: they are tasked with building something (here a research collection of preserved software) that addresses requirements (opening legacy files, researching legacy software titles) that result primarily from the historic investments of third parties in learning and using certain software titles, not on the creative virtues of the titles themselves. Keyboard makers need QWERTY because of typists' investment and reliance; Google needed Java's API calls because of developers' investment and reliance; software collections need to preserve and make available out-of-commerce titles because of the investment and reliance of the original users (who created proprietary files, imbued software with cultural value/meaning, or otherwise made the software a worthy subject of study) and the investment of scholars, teachers, and students (who find access to the software an important part of their work).

In other words, by the time a software program is being preserved and made accessible in a cultural heritage institution, its value to the collection is generally the result of other parties' investment(s) in the program, not the investments of the copyright holder.

Justice Breyer concludes his analysis of the market effect by observing that if fair use does not apply here, ownership of the Java API could serve as a "lock limiting the future creativity of new programs. Oracle alone would hold the key."<sup>115</sup> To the extent that such a lock is really the result of third-party investments in learning and using the Java platform, Breyer argues, it's not consistent with the purposes of copyright to grant Oracle that kind of control. Instead, fair use should unlock this resource and enable the follow-on creativity that will result.<sup>116</sup>

Here, again, the arguments for public benefit from software preservation are similar, and similarly strong. Consider again the case of an archival collection of digital documents that are only fully accessible when rendered by proprietary software. Without fair use, copyright would grant the maker of this software control over not just the

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<sup>112</sup> *Id.* at 1208.

<sup>113</sup> *Google LLC v. Oracle America Inc.*, Oral Argument transcript 47, [https://www.supremecourt.gov/oral\\_arguments/argument\\_transcripts/2020/18-956\\_2dp3.pdf](https://www.supremecourt.gov/oral_arguments/argument_transcripts/2020/18-956_2dp3.pdf).

<sup>114</sup> *Google*, 141 S. Ct. at 1208.

<sup>115</sup> *Id.*

<sup>116</sup> *Id.*

software itself, but also the entire universe of digital resources that can only be fully accessed using that software. That level of control far exceeds the bounds of what copyright law typically protects, and it results in an unjustifiable limitation on public access and downstream creativity (in the form of teaching, research, and scholarship informed by access to the archive). Given the CONTU Report drafters' admonition that copyright "should not grant anyone more economic power than is necessary to achieve the incentive to create," fair use should constrain the market power of software vendors.<sup>117</sup> It's also worth noting that software developers have had plenty of incentive for creation over the years without any stream of revenue from software preservation and long term research access. The creation of a "market" for these uses would represent a windfall to copyright holders and a deadweight loss to the public.

While the clearest implications of the *Google* opinion are for software, the principles deployed in this case are certainly susceptible to an even more generalized reading. At the level of cultural heritage uses generally, the most important takeaways are:

- Fair use continues to play a crucial role in maintaining the central balance in the copyright system between the private incentive to create and distribute new works and the public interest in access and reuse of existing works. As cultural heritage institutions serve the public, they should understand and rely on their fair use rights.
- Core public interest activities like teaching and research are especially worthy of fair use protection, and fair use doctrines like transformative use should be read with an eye to ensuring these activities are not unduly impeded by copyright law.
- Specifically, when analyzing the purpose and character of a use for transformative use purposes, courts should avoid reductive or simplistic characterizations that result in an overly narrow scope of fair use or an overly broad scope of market power.

As an example of the possible influence of the *Google* opinion, imagine if it had been in place before *Cambridge University Press v. Patton* (the case that challenged Georgia State University's copying of excerpts from scholarly books for use in relevant courses) was decided.<sup>118</sup> In that case, both the trial court and the 11th Circuit court of appeals gave a hasty, reductive analysis of transformative use.<sup>119</sup> In the space of a paragraph or less, the courts described the university's use of excerpts from academic books as "verbatim copies" that were assigned to be read, the same basic purpose as the original works themselves.<sup>120</sup>

After *Google*, courts may not move so quickly through such an analysis. Instead, they may ask whether such a simple characterization would result in too narrow a field for fair use, and if so, whether a more nuanced characterization might result in a meaningful distinction between the user's purpose and the original purpose of the work.<sup>121</sup> This more probing analysis could lead courts to find transformative use more often in situations involving teaching, research, scholarship, and other activities where

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<sup>117</sup> CONTU Report at 12.

<sup>118</sup> *Cambridge Univ. Press v. Patton*, 769 F.3d 1232 (11th Cir. 2014); .

<sup>119</sup> See generally Brandon Butler, Transformative Teaching and Educational Fair Use After Georgia State, 48 CONN. L. REV. 473 (2015).

<sup>120</sup> *Cambridge*, 769 F.3d at 1262.

<sup>121</sup> See *Google*, 141 S. Ct. at 1203 ("to stop here would severely limit the scope of fair use" so "we must go further and examine the copying's more specifically described 'purpose[s]' and 'character.'")

fair use is expected generally to have broader application. Given the effect of transformative use on the rest of the fair use analysis, the net result would be a meaningfully stronger fair use right for core fair users.

*Google v. Oracle* provides important fair use guidance for software preservation professionals, cultural heritage institutions, and all fair users. And luckily, it is friendly, useful guidance that will serve digital collections particularly well as they cope with the unique challenges posed by copyright in software.

### B. *Apple v. Corellium*

Two years after *Google*, the 11th Circuit held in *Apple v. Corellium* that Corellium's research emulation service, which provides access to Apple's iOS operating system on a server rather than on Apple's mobile device hardware, was "moderately transformative" because (quoting from *Campbell*) it "add[ed] something new," served a "further purpose or different character," and "does not supersede" ordinary consumer use of the software it runs.<sup>122</sup> A more general-purpose software preservation and research program should pass the transformative test for the same reasons.

The 11th Circuit explained that Corellium 'adds something new' because it "alters iOS by adding features that aren't ordinarily available on the iOS operating system, including: (1) the ability to see and halt running processes; (2) the ability to modify the kernel; (3) CoreTrace, a tool to view system calls; (4) an app browser; (5) a file browser; and (6) the ability to take live snapshots."<sup>123</sup> Software preservation and research platforms like EaaSI have features designed specifically for researchers as well. Most obviously, they enable librarians, archivists, and other cultural heritage professionals to provide researchers with access to legacy digital materials, and to add value to those materials, without collecting or managing vintage hardware. Relatedly, an EaaSI platform can present legacy software and digital media alongside instructions, tutorials, curators' notes, and other contextual information.<sup>124</sup> EaaSI technology also enables researchers to move from one point in the history of computing to another seamlessly, without moving literally from one fragile vintage hardware setup to another. And it allows researchers to save derivative versions of computing environments that they develop specifically to serve their research purposes and share those configurations with other EaaSI users to enable teaching, research reproducibility, and other new uses.<sup>125</sup>

The 11th Circuit found that Corellium "has a further purpose or different character" relative to the ordinary consumer use of iOS because it "giv[es] researchers the ability to examine and understand both iOS itself and iOS-based applications in advanced new ways."<sup>126</sup> EaaSI similarly enables researchers to examine and understand software and software-dependent digital materials originally created for legacy hardware and software environments in advanced ways.

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<sup>122</sup> *Apple, Inc. v. Corellium, Inc.*, No. 21-12835, slip op. at 20-21 (11th Cir. May 8, 2023) (unpublished).

<sup>123</sup> *Id.*

<sup>124</sup> See generally EaaSI User Handbook, [https://eaasi.gitlab.io/eaasi\\_user\\_handbook/index.html](https://eaasi.gitlab.io/eaasi_user_handbook/index.html) (Jan. 24, 2025).

<sup>125</sup> *Id.*

<sup>126</sup> *Apple*, slip op. at 7.

Finally, the 11th Circuit noted that the Corellium software could *not* provide a consumer with a substitute for the features that make iOS attractive in its ordinary use context (on a smart phone or tablet), thus ensuring that it “does not supersede” iOS in the marketplace. Examples of these shortcomings included that Corellium did not run iOS “on a physical phone in your pocket,” and that it “can’t be used to make phone calls, send texts, take photos, navigate with GPS, or download apps from the App Store.”<sup>127</sup>

Similarly, software in an emulated research environment like the ones facilitated by EaaS will consistently, systematically fail to offer an experience for users that would supersede the experience of owning contemporary software that performs the same functions much more effectively and efficiently. First and most importantly, the software available for use in EaaS will necessarily be obsolete, unsupported, out-of-commerce software that has been superseded by its makers, replaced with versions that have new features and take advantage of the latest hardware. Second, software in EaaS will only be available within the limited and controlled environment of the EaaS framework - it will be “sandboxed” in the browser and limited to the capabilities of its virtual environment, unlike software that is owned by a user and designed to run on faster modern equipment.<sup>128</sup> Additional limitations can be configured by the EaaS platform’s operator (typically a library or archives), including limiting users’ ability to print, save, and export files or other outputs, limiting the duration of their access to EaaS, and curtailing their ability to connect to networks.<sup>129</sup>

EaaS would have a further advantage over both Google and Corellium in the transformative use calculus because out-of-commerce software will comprise the majority (if not the entirety) of the body of works accessed via EaaS.<sup>130</sup> The claim of commercial substitution loomed larger in *Google*, and was at least arguable in *Corellium*, because in those cases the software at issue was currently available in the marketplace. This may help to explain the 11th Circuit’s designation of the defendant’s use as only “moderately” transformative. EaaS, by contrast, would be used almost exclusively for preserving and accessing software that is no longer commercially available.<sup>131</sup> To the extent that transformative use anticipates the fourth factor question of market effect by asking whether there is impermissible overlap in purpose that would pose a threat of market substitution, use of EaaS to facilitate access to out-of-commerce software has the strongest argument of the three technologies.

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<sup>127</sup> *Id.* at 18.

<sup>128</sup> See EaaS User Handbook, *supra* n. 124.

<sup>129</sup> *Id.*

<sup>130</sup> See U.S. Copyright Office, *Section 1201 Rulemaking: Ninth Triennial Proceeding to Determine Exemptions to the Prohibition on Circumvention—Register’s Recommendation* 163, [https://www.copyright.gov/1201/2024/2024\\_Section\\_1201\\_Registers\\_Recommendation.pdf#page=166.10](https://www.copyright.gov/1201/2024/2024_Section_1201_Registers_Recommendation.pdf#page=166.10) (Oct. 2024) (describing Software Preservation Network’s request for DMCA exemptions permitting access to out-of-commerce software).

<sup>131</sup> The software preservation community’s focus on out-of-commerce software is evinced in the scope of the exemptions it has sought in the triennial DMCA rulemakings. See KENDRA ALBERT & KEE YOUNG LEE, *A PRESERVATIONIST’S GUIDE TO THE DMCA EXEMPTION FOR SOFTWARE PRESERVATION* (2d. ed. 2022), available at [https://www.softwarepreservationnetwork.org/wp-content/uploads/2020/02/1201-Preservationists-Guide-to-DMCA-Exemption\\_11182022.pdf](https://www.softwarepreservationnetwork.org/wp-content/uploads/2020/02/1201-Preservationists-Guide-to-DMCA-Exemption_11182022.pdf).

### C. The Code of Best Practices in Fair Use for Software Preservation

For nearly two decades, practice communities that rely on fair use have been developing codes and statements of best practices that describe how fair use applies to recurring scenarios in their own work.<sup>132</sup> The first Code was developed by documentary filmmakers, and led to a major shift in the industry, as insurers and distributors recognized the legitimacy of fair use in documentary film and new kinds of movies were made.<sup>133</sup> Subsequent statements have been published by research librarians, archivists, poets and poetry scholars, journalists, visual artists and art critics, and media scholars and teachers.<sup>134</sup> In 2019, the software preservation community joined this growing list, publishing the *Code of Best Practices in Fair Use for Software Preservation*.<sup>135</sup> The *Code* explains five situations where fair use applies to routine activities in a software preservation workflow, from accession to documentation, from networked access to source code. Grounded in these principles, the software preservation community has grown increasingly confident in working together to do what's needed to save software, and software-dependent cultural heritage, together.

### D. The Triennial DMCA Rulemakings

Bolstered in part by its work on the *Code*, the software preservation community has engaged since 2018 with the triennial rulemaking required by 17 USC § 1201, which grants exemptions from the general bar on breaking so-called “technical protection measures” (TPMs) that control access to in-copyright works. Because so much software is encumbered with these measures—authentication servers, encryption keys, dongles, and the like—the rule against breaking them could be a major impediment to preservation. Courts have not been consistent on the question of whether circumvention must be connected to infringement, rather than for an otherwise lawful purpose, to constitute a violation of the DMCA.<sup>136</sup> Thus even when preservation of software is a fair

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<sup>132</sup> See generally Patricia Aufderheide and Peter Jaszi, *Reclaiming Fair Use* (2d Ed. 2018); Anthony Falzone & Jennifer Urban, *Demystifying fair use: The gift of the Center for Social Media statements of best practices*, 57 J. COPYRIGHT SOC'Y USA 337 (2009).

<sup>133</sup> Fred von Lohmann, *Fair Use Has a Posse - Now with Insurance!*, ELECTRONIC FRONTIER FOUNDATION, <https://www.eff.org/deeplinks/2007/02/fair-use-has-posse-now-insurance> (Feb. 23, 2007).

<sup>134</sup> The codes are collected and made available by the Center for Media and Social Impact at American University, <https://cmsimpact.org/report-list/codes/>.

<sup>135</sup> Association of Research Libraries et al., *Code of Best Practices in Fair Use for Software Preservation*, <https://cmsimpact.org/wp-content/uploads/2018/09/2019.2.28-software-preservation-code-revised.pdf> (Rev'd 2019).

<sup>136</sup> *Compare* Lexmark Intern. v. Static Control Components, 387 F.3d 522, 552 (6th Cir. 2004) (“Unless a plaintiff can show that a defendant circumvented protective measures for such a[n] infringing] purpose, its claim should not be allowed to go forward”) (Merrit, J., concurring), with *Universal City Studios, Inc. v. Corley*, 273 F.3d 429, 443 (2d Cir. 2001) (rejecting a narrow construction of the DMCA to avoid its application to otherwise lawful uses as “outside the range of plausible readings of the provision”).

use, if it involves circumvention of a TPM, it may still be unlawful.<sup>137</sup> So, the Software Preservation Network and other library groups have successfully sought exemptions from the DMCA in each of the last three cycles of the DMCA rulemaking.<sup>138</sup>

### CONCLUSION

Bringing software into the copyright system was a controversial policy choice, and courts have acknowledged that “applying copyright law to computer programs is like assembling a jigsaw puzzle whose pieces do not quite fit.”<sup>139</sup> While scholars, lobbyists, and legislators were focused on the consequences for consumers and competitors, it has been long enough, now, that we can begin to take stock of the consequences for our cultural heritage. They have been overwhelmingly negative—collecting and preserving digital heritage has been more costly and uncertain thanks to the pall cast by copyright fear, uncertainty, and doubt. However, as the software preservation community begins to flex its fair use rights, administrative agencies acknowledge their importance, and the courts build case law that supports their claims, we may be witnessing a turning point in digital cultural preservation.

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<sup>137</sup> *Universal City Studios*, 273 F.3d at 443.

<sup>138</sup> See generally Albert et al., *supra* n. 83. In each cycle, the Copyright Office has recommended narrower exemptions than the software preservation community has proposed, especially with respect to the scope of access permitted for research and teaching uses. By contrast, National Telecommunications and Information Administration has recognized the value of broader access

<sup>139</sup> *Lotus Dev. Corp. v. Borland Int'l, Inc.*, 49 F.3d 807, 820 (1st Cir. 1995) (Boudin, J., concurring)