

Would You Like to Save Your Game?: Establishing a Legal Framework for Long-Term Digital Game Preservation

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TABLE OF CONTENTS

I.	INTRODUCTION	567
II.	A BRIEF HISTORY OF DIGITAL GAMES AND THEIR FORMATS	572
	A. <i>Invention</i>	573
	B. <i>Cartridges and the First Home Consoles</i>	574
	C. <i>The Move to Optical Media</i>	576
	D. <i>The Rise of Digital Distribution</i>	576
III.	THE CHALLENGES FACING GAME PRESERVATION	578
	A. <i>Technical Challenges and the Need for Preservation</i>	578
	1. <i>Media Degradation</i>	578
	2. <i>Obsolescence</i>	580
	B. <i>Legal Hurdles for Game Preservation</i>	583
	1. <i>Copyright</i>	583
	2. <i>Source Code and Trade Secret Law</i>	586
	3. <i>DRM and Server-Side Authentication</i>	587
	4. <i>What of Private Preservation Efforts?</i>	589
	C. <i>Current State of Game Preservation</i>	591
IV.	ESTABLISHING A FEDERALLY FUNDED PRESERVATION BOARD.....	591
	A. <i>Film Preservation: A Case Study</i>	592
	1. <i>Early Film Preservation Efforts (Late 1800s–1988)</i>	594
	2. <i>Establishment of the National Film Preservation Board</i> ...	596
	B. <i>Establishing a Federally Funded Preservation Board</i>	598
	1. <i>Establishing and Maintaining a Source Code Archive</i>	599
	2. <i>Establishing a Collective Stance Regaining DMCA</i> <i>Exceptions</i>	602
	3. <i>Establishing Model Agreements and Best Practices</i>	603
V.	CONCLUSION.....	604

I. INTRODUCTION

“Anything not saved will be lost.”

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–Nintendo Wii quit message

Since their invention in the 1960s,¹ digital games²—also known as video games, computer games, or electronic games—have grown from a quirky digital novelty into a diverse artistic medium,³ an economic juggernaut,⁴ and a mainstream cultural touchstone.⁵ As of 2018, around 60% of Americans play

¹ See STEVEN L. KENT, *THE ULTIMATE HISTORY OF VIDEOGAMES: FROM PONG TO POKÉMON AND BEYOND—THE STORY BEHIND THE CRAZE THAT TOUCHED OUR LIVES AND CHANGED THE WORLD* 16–26 (2001) (tracking some of the earliest, self-isolated examples of people designing digital games).

² For simplicity’s sake, “digital games,” within the context of this Note, will be used primarily to refer to games developed for home video game consoles. While a good portion of the discussion in this Note can be applied to computer games, arcade games, mobile phone games, and other electronic games (such as the Tiger Electronic games of the ’90s), each of these forms presents its own unique history and preservation challenges. This Note also focuses on the preservation of software, though it should be noted that the preservation of hardware presents its own difficulties and considerations. See, e.g., Adi Robertson, *The Last Scan: Inside the Desperate Fight to Keep Old TVs Alive*, VERGE (Feb. 6, 2018), <https://www.theverge.com/2018/2/6/16973914/tvs-crt-restoration-led-gaming-vintage> [<https://perma.cc/7DV2-7X6H>] (covering the obsolescence and death of CRT televisions and noting how a “game’s look and feel is often highly dependent on specific hardware setups”).

³ See, e.g., Paola Antonelli, *Video Games: 14 in the Collection, for Starters*, MUSEUM MOD. ART (Nov. 29, 2012), https://www.moma.org/explore/inside_out/2012/11/29/video-games-14-in-the-collection-for-starters/ [<https://perma.cc/Y7RW-UPP8>] (announcing the admission of digital games to the Museum of Modern Art and proclaiming, “Are video games art? They sure are, but they are also design . . . [The games selected are] outstanding examples of interaction design—a field that MoMA has already explored and collected extensively, and one of the most important and oft-discussed expressions of contemporary design creativity.”). As of 2011, the United States Supreme Court has held that digital games qualify for First Amendment protection, holding that “[l]ike the protected books, plays, and movies that preceded them, video games communicate ideas—and even social messages—through many familiar literary devices (such as characters, dialogue, plot, and music) and through features distinctive to the medium (such as the player’s interaction with the virtual world).” *Brown v. Entm’t Merchs. Ass’n*, 564 U.S. 786, 790 (2011).

⁴ See ENTM’T SOFTWARE ASS’N, 2018 SALES, DEMOGRAPHIC, AND USAGE DATA: ESSENTIAL FACTS ABOUT THE COMPUTER AND VIDEO GAME INDUSTRY 14 (Apr. 2018), http://www.theesa.com/wp-content/uploads/2018/05/EF2018_FINAL.pdf [<https://perma.cc/CJ53-NFC6>] [hereinafter ESA 2018 REPORT] (reporting that “[t]he US video game industry’s value added to US GDP was more than \$11.7 billion”); Christopher Correa, *Why Video Games Are More Addictive and Bigger than Movies Will Ever Be*, FORBES (Apr. 11, 2013), <https://www.forbes.com/sites/christophercorrea/2013/04/11/why-video-games-are-addictive-and-bigger-than-movies-will-ever-be/#6162333b66f6> [<https://perma.cc/243B-TSSG>] (discussing how digital games continue to surpass films in both profits and cultural reach).

⁵ See, e.g., Austen Goslin, *Why Fortnite Is the Most Important Game of the Decade*, POLYGON (Nov. 14, 2019), <https://www.polygon.com/2019/11/14/20965516/fortnite-battle-royale-most-important-game-2010s> [<https://perma.cc/5NHK-JUEH>] (discussing the cultural impact of *Fortnite* only two years after its release, including the creation of new internet

some form of digital games daily.⁶ Despite the persistent boy's club nature of the industry and culture around digital games,⁷ actual consumption of digital games has gradually become more egalitarian, with women representing 45% of self-identified gamers as of 2018.⁸ Further, the average age of players continues to get older over time, with the vast majority of digital game players now over the age of eighteen.⁹

Regardless of the ongoing discussions regarding the artistic merits and capabilities of digital games, their cultural and historical relevance is undeniable. In addition to representing how a growing portion of our current culture spends their leisure time, even their most problematic aspects offer

celebrities and “an in-game music concert attended by nearly 11 million people”). *See generally* HAROLD GOLDBERG, *ALL YOUR BASE ARE BELONG TO US: HOW FIFTY YEARS OF VIDEOGAMES CONQUERED POP CULTURE* (2011) (presenting a study of the ubiquity of digital games in popular culture).

⁶ESA 2018 REPORT, *supra* note 4, at 5; *see also* MAEVE DUGGAN, PEW RESEARCH CTR., *GAMING AND GAMERS 2* (Dec. 2015), http://www.pewresearch.org/wp-content/uploads/sites/9/2015/12/PI_2015-12-15_gaming-and-gamers_FINAL.pdf [<https://perma.cc/R6UA-WHZE>] (finding that 49% of American adults play games); ELEC. ENTMT DESIGN & RESEARCH, *GAMER SEGMENTATION: 2018 SYNDICATED REPORT 6* (2018), <https://www.npd.com/lps/pdf/EEDAR-2018%20Gamer%20Segmentation%20Report-WP.pdf> [<https://perma.cc/QA6P-WHHL>] (finding that 67% of Americans who are more than two years old play digital games, 43% of which play on dedicated consoles and 90% of which play on mobile devices).

⁷*See generally* Leigh Alexander, *All the Women I Know in Video Games Are Tired*, OFFWORLD (May 29, 2015), <https://boingboing.net/2015/05/29/all-the-women-i-know-in-video.html> [<https://perma.cc/MS4J-PNS2>] (discussing the exhausting lengths that women often must go to in order to feel validated working in or with the digital games industry).

⁸Christina Gough, *Distribution of Computer and Video Gamers in the United States from 2006 to 2019, by Gender*, STATISTA (July 3, 2019), <https://www.statista.com/statistics/232383/gender-split-of-us-computer-and-video-gamers/> [<https://perma.cc/WL8U-CH7Z>] (showing that this percentage has gradually risen from 38% in 2006); *see also* DUGGAN, *supra* note 6, at 2 (finding that “[a] majority of American adults (60%) believe that most people who play video games are men,” but that a “nearly identical share of men and women report ever playing video games (50% of men and 48% of women)”).

⁹Christina Gough, *Average Age of U.S. Video Game Players in 2019*, STATISTA (Sept. 18, 2019), <https://www.statista.com/statistics/189582/age-of-us-video-game-players-since-2010/> [<https://perma.cc/K9RH-46DX>].

unique widows into contemporary understandings of topics such as modern gender dynamics,¹⁰ race relations,¹¹ and public perceptions of the military.¹²

Unfortunately, the rapid growth and evolution of this powerful medium has left a scattered and rapidly decaying history in its wake. The physical media holding many of the games from the last few decades has literally begun to rot away,¹³ the code needed to ensure long term preservation is often lost or inaccessible,¹⁴ and several layers of legal barriers stand in the way of looking for lawful solutions to long-term preservation.¹⁵ As a young and technology-driven medium, the digital games industry and the conversations around it have an often crippling short-term memory, and the conversations around digital games often focus on the innovations of the future rather than the foundations laid by the past.¹⁶ Many of the foundational games that represent the birth and early evolution of digital games are disappearing bit by electronic bit, and we are actively losing the generation of inventors and designers that defined the earliest days of digital games.¹⁷ Without proactive measures, much of the history

¹⁰ See generally Feminist Frequency, *Damsel in Distress: Part 1—Tropes vs Women in Video Games*, YOUTUBE (Mar. 7, 2013), https://www.youtube.com/watch?v=X6p5AZp7r_Q&list=PLn4ob_5_ttEaA_vc8F3fjzE62esf9yP61&index=2&t=139s [<https://perma.cc/PTU8-9EF5>] (depicting the first in a series of videos examining “the plot devices and patterns most often associated with female characters in gaming from a systemic, big picture perspective”).

¹¹ See, e.g., Sandy Ong, *The Video Game Industry’s Problem with Racial Diversity*, NEWSWEEK MAG. (Oct. 13, 2016), <https://www.newsweek.com/2016/10/21/video-games-race-black-protagonists-509328.html> [<https://perma.cc/3C8L-8THV>] (discussing the lack of black protagonists in games and the stereotypes that existing black protagonists typically fall into).

¹² See, e.g., *America’s Army: Proving Grounds*, U.S. ARMY, <https://www.americasarmy.com/aapg> [<https://perma.cc/59FL-KV9Q>] (providing a free download of America’s Army: Proving Grounds, “the Official Game of the U.S. Army”—a first-person shooter intended as a military recruitment tool).

¹³ See *infra* Part III.A.1.

¹⁴ See *infra* Part III.A.2.

¹⁵ See *infra* Part III.B.

¹⁶ See Gita Jackson, *The Vast, Unplayable History of Video Games*, OFFWORLD (May 28, 2015), <https://boingboing.net/2015/05/28/the-vast-unplayable-history-o.html> [<https://perma.cc/79AR-WMW2>] (quoting author and professor Ian Bogost as saying, “Collectively, we have a short memory, mostly back to the childhoods of whatever generation is currently not fed up with games enough to romanticize it . . . [T]he bigger trends always seem to start from scratch, unaware of what came before, unable to incorporate and build upon it.”).

¹⁷ See, e.g., Douglas Martin, *Ralph H. Baer, Inventor of First System for Home Video Games, Is Dead at 92*, N.Y. TIMES (Dec. 7, 2014), <https://www.nytimes.com/2014/12/08/business/ralph-h-baer-dies-inventor-of-odyssey-first-system-for-home-video-games.html> [<https://perma.cc/A8JS-9XNZ>] (describing the influence of the man who invented the first home video game console).

of digital games stands to be lost forever—potentially within the next few decades.¹⁸

In this current atmosphere of retro resurgence,¹⁹ decades may seem like plenty of time to craft a solution and many older games may still feel readily available to the general public.²⁰ But the early days of film preservation presents a harrowing case study of just how quickly those years can pass and how large swaths of our culture and history can be forever lost when industry figureheads and legislators fail to coordinate with preservationists.²¹ The problems facing digital game preservation are wrapped up in a unique web of intellectual property law that may take many years to untangle.²² Meanwhile, the broad commercial value (and thus availability) of much of gaming history should not be expected to maintain its current intensity past our collective familiarity with it.²³ As the generations of people who cherish these early games begin to die off, so too will the games themselves.²⁴ We as a society must prioritize preservation while interest is high and the games are still available, or else we risk repeating the failures of early film preservation and losing a vital part of our shared cultural history.

¹⁸ Henry Lowood, *Introduction*, in *BEFORE IT'S TOO LATE: A DIGITAL GAME PRESERVATION WHITE PAPER* 139, 139–40 (Henry Lowood ed., 2009).

¹⁹ See, e.g., John Nelson Rose, *Retro Games as a Revivalist Movement*, GAMASUTRA (July 9, 2018), https://www.gamasutra.com/blogs/JohnNelsonRose/20180709/321546/Retro_Games_as_a_Revivalist_Movement.php [<https://perma.cc/5J4W-YKNS>] (arguing that the current “Retro Game Renaissance” in modern game design is akin to the revivalist neoclassical and gothic revival architecture movements).

²⁰ See, e.g., Ben Gilbert, *Which Mini Retro Game Console Is Right for You: NES Classic, Super NES Classic, or PlayStation Classic?*, BUS. INSIDER (Nov. 14, 2018), <https://www.businessinsider.com/nes-mini-super-nes-mini-ps1-classic-compared-2018-11> [<https://perma.cc/K28A-TUUN>] (covering the recent fad of miniature versions of classic game consoles pre-loaded with older games).

²¹ See *infra* Part IV.A.

²² See Mark Methenitis, *Laws of the Game: Intellectual Property in the Video Game Industry*, in *VIDEO GAME POLICY: PRODUCTION, DISTRIBUTION, AND CONSUMPTION* 11, 11 (Steven Conway & Jennifer deWinter eds., 2016) (“Software is one of the only items in which all three major forms of intellectual property—copyright, trademark, and patent—can be present in one product.”).

²³ See Christian Candia et al., *The Universal Decay of Collective Memory and Attention*, 3 *NATURE HUM. BEHAV.* 82, 85 (2019) (finding that cultural products such as music and movies typically remain in the collective “communicative memory” of the public for only five to ten years, while biographies of famous individuals can be expected to last fifteen to thirty years); see also Sean Fenty, *Why Old School Is “Cool”: A Brief Analysis of Classic Video Game Nostalgia*, in *PLAYING THE PAST: HISTORY AND NOSTALGIA IN VIDEO GAMES* 19, 22 (Zach Whalen & Laurie N. Taylor eds., 2008) (referring to people born in the last forty years as the “games generation” and discussing how the unique spatial features of digital games create a powerful nostalgia in players by offering “a past within which players can participate, and a past in which players can move and explore”).

²⁴ Candia et al., *supra* note 23, at 87–88 (explaining how “the dynamics of human collective memory follow a universal decay function”).

The goal of this Note is to urge the establishment of an administrative and legal framework that facilitates the long-term preservation of digital games and promotes coordination between game publishers, industry organizations, and public and nonprofit archives. Part II begins with a streamlined history of digital games, with a specific focus on the diversity of storage mediums and the recent transition from physical to digital distribution.²⁵ Part III discusses the technological and legal hurdles that stand in the way of preservation, the antagonism of major industry organizations towards current preservation efforts, and the current state of digital game preservation. Much of this Part will focus specifically on the importance of source code to long-term preservation and how industry negligence and volatility has led to and will continue to lead to irreparable losses. Part IV urges the legislative establishment of a national game preservation board to coordinate preservation efforts between game publishers, industry organizations, and public and nonprofit archives. A brief history of the early losses of film preservation is presented as a case study of just how quickly the foundations of a new medium can be lost, while the eventual establishment of the National Film Preservation Board presents a model for how to approach digital game preservation. Part VI briefly concludes.

II. A BRIEF HISTORY OF DIGITAL GAMES AND THEIR FORMATS

The history of games has been shaped by their dual existence as an interactive mode of expression driven by human ingenuity and creativity, and their commercial identity as consumer products, driven by tech trends and popular tastes.²⁶ It is this latter identity as a tech-driven consumer product that has left the medium's history scattered across a variety of incompatible formats and hardware configurations. Consideration of even the most streamlined history of console games and the transition from physical media to digital distribution underscores the magnitude of this issue and the technological hurdles that must be cleared to ensure long-term preservation. Note that, perhaps ironically, the brevity of such a truncated history will necessarily skip over many of the more esoteric corners of digital games' history (such as the endearingly

²⁵ Even this briefest of histories underscores the sheer number of formats and hardware configurations presented by digital games and the unique challenges of preserving a medium whose history is scattered across these disparate platforms.

²⁶ Steven Conway & Jennifer deWinter, *Introduction* to VIDEO GAME POLICY: PRODUCTION, DISTRIBUTION, AND CONSUMPTION, *supra* note 22, at 1, 2 (“[V]ideo games are part of a broader media landscape that exists in the contested space between artistic freedom and economic incentives.”).

bizarre Vectrex home vector graphics system)²⁷ that are arguably the most in danger of being lost to time.²⁸

A. *Invention*

We as human beings are naturally hardwired to play.²⁹ Thus, it seems only natural that, given some time, the emerging computer technology of the mid-twentieth century would produce games of some sort.³⁰ In fact, it seems it was so natural that it happened in at least three separate and isolated instances.³¹ The earliest known digital game was William Higginbotham's 1958 *Tennis for Two*, which played on a scaling oscilloscope and was created as a tech demo so that people would have something to interact with during an open house at the U.S. government's Brookhaven National Laboratory.³² Four years later, in 1962, without any knowledge of *Tennis for Two*, Steve Russell and a group of MIT students designed the second known digital game, *Space Wars*, programmed on a stack of paper punch cards—purely for their own amusement rather than any commercial aspirations.³³ The game became well known across the MIT campus but never reached the broader public consciousness.³⁴ It wasn't until 1972, with Ralph Baer's invention of the Magnavox Odyssey home console, that digital games first became available to general consumers.³⁵ The first reaction to this monumental marriage of technology and play was, as one might

²⁷ See KENT, *supra* note 1, at 230–33; Ben Kuchera, *Why I'm Still Hung Up on the Weirdest Console Flop of the 1980s: When You Can't Separate the Hardware from the Games*, POLYGON (Aug. 1, 2018), <https://www.polygon.com/2018/7/30/17616756/vectrex-backlog-classic-gaming> [<https://perma.cc/7RUY-7UQF>].

²⁸ For simplicity's sake, the history presented below is based on American markets using American release dates. For a more complete picture of the earliest days of digital games, see generally KENT, *supra* note 1.

²⁹ Kerrie Lewis Graham & Gordon M. Burghardt, *Current Perspectives on the Biological Study of Play: Signs of Progress*, 85 Q. REV. BIOLOGY 393, 400–02 (2010) (finding that “[p]lay is well-developed in primates, rodents, carnivorans, ungulates, elephants, and cetaceans,” but that play behavior may extend as far as insects and other invertebrates).

³⁰ See Gita Jackson, *Spacewar! Creators Didn't Know They Were Making History*, KOTAKU (Dec. 5, 2018), <https://kotaku.com/spacewar-creators-didnt-know-they-were-making-history-1830887504> [<https://perma.cc/26LU-PL3A>] (quoting one early inventor, Martin Graetz, as saying, “There was never any sense in any way that we were creating something new. . . . It was all a lark.”).

³¹ KENT, *supra* note 1, at 26; Mark Guttenbrunner et al., *Keeping the Game Alive: Evaluating Strategies for the Preservation of Console Video Games*, 5 INT'L J. DIGITAL CURATION 64, 68 (2010); Jackson, *supra* note 30.

³² KENT, *supra* note 1, at 18; Guttenbrunner et al., *supra* note 31, at 68.

³³ KENT, *supra* note 1, at 16–21; Guttenbrunner et al., *supra* note 31, at 68; Jackson, *supra* note 30.

³⁴ KENT, *supra* note 1, at 20.

³⁵ *Id.* at 21–26.

expect, one of mild confusion, public disinterest, and economic failure.³⁶ A new medium was born.

B. Cartridges and the First Home Consoles

At their very simplest, programmable cartridges consist of a plastic shell, a printed circuit board, and some form of ROM chip to store the game.³⁷ Both internal and external designs vary wildly from console to console, and even within the same console, individual game cartridges may vary wildly³⁸ or even contain extra hardware elements such as graphics chips,³⁹ save batteries,⁴⁰ or sound chips.⁴¹

The Magnavox Odyssey technically had the first game cartridges,⁴² but these were quite different from the cartridges many of us are familiar with today. The Odyssey's cartridges contained no actual software but "merely complete[d] different circuit paths within the hardware itself to define the rule set for the current game."⁴³ Meanwhile, when Atari released the consumer version of *Pong* to home markets in 1975, its strategy was even simpler: the system *only* played *Pong*.⁴⁴

³⁶ See Alexander Smith, *ITL200: A Magnavox Odyssey*, THEY CREATE WORLDS, <https://videogamehistorian.wordpress.com/2015/11/16/1tl200-a-magnavox-odyssey/> [<https://perma.cc/YA3X-QCAN>] (finding that the Odyssey's early poor performance was likely the result of high price and confusing marketing).

³⁷ Benj Edwards, *The Untold Story of the Invention of the Game Cartridge*, FAST COMPANY (Jan. 22, 2015), <https://www.fastcompany.com/3040889/the-untold-story-of-the-invention-of-the-game-cartridge> [<https://perma.cc/3AZC-EZ6D>].

³⁸ See, e.g., *The SNES Cartridge, Briefly Explained*, POOR STUDENT HOBBYIST (May 18, 2019), <https://thepoorstudenthobbyist.com/2019/05/18/custom-pcb-explanation/> [<https://perma.cc/J7N5-CJFP>] (explaining that Super Nintendo cartridges alone can be sorted into "six major categories," which may then contain various "enhancement chips").

³⁹ See, e.g., Kyle Orland, *Nintendo Could Have Supported Super FX Long Before the SNES Classic*, ARS TECHNICA (July 7, 2017), <https://arstechnica.com/gaming/2017/07/nintendo-could-have-supported-super-fx-long-before-the-snes-classic/> [<https://perma.cc/A6F9-46PQ>] (discussing some of the difficulties of emulating games that use the Super Nintendo Super FX chip for 3D graphics).

⁴⁰ See Derek Mead, *How to Replace an SNES Cartridge's Save Game Battery*, VICE (Dec. 25, 2012), https://motherboard.vice.com/en_us/article/pggkmm/pictures-how-to-replace-an-snes-cartridge-save-game-battery [<https://perma.cc/YD48-PKCR>] (explaining how to replace the batteries that many Super Nintendo games use to save the player's progress).

⁴¹ See Apparatus for Producing a Plurality of Audio Sound Effects, U.S. Patent No. 4,314,236 (filed Jan. 24, 1979) (registering the patent for the "POKEY" sound chip, used in certain Atari 7800 games).

⁴² Smith, *supra* note 36.

⁴³ *Id.*

⁴⁴ KENT, *supra* note 1, at 80–81.

It wasn't until 1976 that the obscure Fairchild Channel F system introduced what we now recognize as programmable cartridges.⁴⁵ This same technology soon became ubiquitous across home consoles and was adopted by the Atari 2600 in 1977, the Mattel Intellivision in 1980, and Coleco's Colecovision in 1982.⁴⁶ This same technology was used by Nintendo and Sega throughout the late eighties and early nineties⁴⁷ with the Nintendo Entertainment System (1985),⁴⁸ the Sega Master System (1987),⁴⁹ the Sega Genesis (1989),⁵⁰ the Super Nintendo Entertainment System (1991),⁵¹ and the Nintendo 64 (1996).⁵²

Despite the fact that optical media has almost fully supplanted cartridges as the preferred storage medium for modern home consoles,⁵³ cartridges still remain in use to this day.⁵⁴ And while cartridges reigned supreme after the release of the Channel F, they were not the only storage medium used during this era. Certain consoles and computers also stored games on similar but much more fragile media such as floppy disks,⁵⁵ cassettes,⁵⁶ and even VHS tapes.⁵⁷

⁴⁵ Guttenbrunner et al., *supra* note 31, at 69.

⁴⁶ *Id.*

⁴⁷ This was following a brief market crash in 1983 that eliminated most of the industry and paved the way for Nintendo and Sega to rise in prominence. *See* KENT, *supra* note 1, at 234–40; N. R. Kleinfield, *Video Games Industry Comes Down to Earth*, N.Y. TIMES (Oct. 17, 1983), <https://www.nytimes.com/1983/10/17/business/video-games-industry-comes-down-to-earth.html> [<https://perma.cc/88VW-7L8S>].

⁴⁸ KENT, *supra* note 1, at 296–97.

⁴⁹ Guttenbrunner et al., *supra* note 31, at 70.

⁵⁰ KENT, *supra* note 1, at 404.

⁵¹ *Id.* at 431.

⁵² *Id.* at 537.

⁵³ *See infra* Part II.C.

⁵⁴ The 2017 Nintendo Switch is the most recent example of a home console that uses cartridges as a storage medium despite the greater cost of production. Wesley Yin-Poole, *Why Nintendo Switch Games Are Ending Up More Expensive*, EUROGAMER (Mar. 13, 2017), <https://www.eurogamer.net/articles/2017-03-10-why-nintendo-switch-games-are-ending-up-more-expensive> [<https://perma.cc/P9VS-3XRW>] (reporting that the cost of producing Nintendo Switch cartridges might be causing Switch games to cost more than those on consoles that use Blu-ray discs).

⁵⁵ *See* J.d. Biersdorfer, *The Lifespan of a Diskette*, N.Y. TIMES (Dec. 29, 2005), <https://www.nytimes.com/2005/12/29/technology/circuits/the-lifespan-of-a-diskette.html> [<https://perma.cc/8QU7-PBNT>] (“Some studies have shown that a diskette has an estimated life span of 10 years if stored in a cool, dry place with average care and use.”).

⁵⁶ Fabrizio Gennari, *How Commodore Tapes Work*, WAV-PRG, <http://wav-prg.sourceforge.net/tape.html> [<https://perma.cc/93EL-4MRA>] (explaining how the Commodore 64 home computer read games off cassette tapes).

⁵⁷ Luke Plunkett, *Only in the 80's Would They Put Video Games on a VHS Tape*, KOTAKU (Mar. 28, 2011), <https://kotaku.com/5786220/only-in-the-80s-would-they-put-video-games-on-a-vhs-tape> [<https://perma.cc/7YWJ-NN57>] (covering the largely experimental attempts to use VHS as a storage medium for digital games).

C. *The Move to Optical Media*

Beginning in the early nineties, the lower price and higher capacity of compact discs (CDs) caused many console manufacturers to switch to optical media.⁵⁸ In 1992, Sega released the Sega CD add-on for the Sega Genesis, a peripheral which allowed the Genesis to play the first CD-ROM games for American home consoles.⁵⁹ The oft-forgotten 3DO was the first American console to play CD-ROMs out of the box in 1993, but the true shift toward optical media didn't become a market force in digital games until the release of the Sony PlayStation in 1994.⁶⁰ Optical media has been the primary storage medium for home consoles ever since, with most manufacturers moving to DVDs in the early 2000s and, later, Blu-rays discs, starting with the PlayStation 3 in 2006.⁶¹

D. *The Rise of Digital Distribution*

The earliest example of digital distribution for home consoles in the United States can be traced all the way back to the Atari 2600 and the GameLine download service launched in 1983.⁶² Using a special cartridge with a built-in modem, users could download Atari 2600 games over their phonelines.⁶³ Unfortunately for GameLine, the launch of the service came near the end of the 2600's life and coincided with the 1983 collapse of the video game market, leading to the service's quick death and relative obscurity.⁶⁴ Over a decade later, Sega would launch the similarly ill-fated Sega Channel, which downloaded games to the Genesis through a local cable provider.⁶⁵

Despite these inauspicious beginnings, digital distribution has come to be a major force in the market,⁶⁶ and its proliferation has strong implications for game preservation. Each of the “big three” modern home console

⁵⁸ Guttenbrunner et al., *supra* note 31, at 70. “Optical media” includes storage mediums such as CDs, DVDs, and Blu-ray discs. *Id.* at 73.

⁵⁹ KENT, *supra* note 1, at 451.

⁶⁰ Guttenbrunner et al., *supra* note 31, at 70–71. A newcomer to the market, Sony controlled 47% of the console market by August 1997. KENT, *supra* note 1, at 558.

⁶¹ Guttenbrunner et al., *supra* note 31, at 71–73.

⁶² Justin Olivetti, *The Game Archaeologist: GameLine*, ENGADGET (Mar. 9, 2013), <https://www.engadget.com/2013/03/09/the-game-archaeologist-gameline/> [<https://perma.cc/67P7-S6YN>].

⁶³ *Id.*

⁶⁴ *Id.*

⁶⁵ Bloomberg News, *Sega Channel Is Expanding*, N.Y. TIMES (July 12, 1994), <https://www.nytimes.com/1994/07/12/business/sega-channel-is-expanding.html> [<https://perma.cc/LU6A-J6NU>].

⁶⁶ See ESA 2018 REPORT, *supra* note 4, at 11 (showing that 79% of digital game sales in 2017 were in a digital rather than physical format). Note, however, that this statistic includes full games, subscriptions, add-on content, mobile apps, and social network games.

manufacturers—Nintendo, Sony, and Microsoft—offer robust digital sales platforms and subscription services,⁶⁷ and an increasing number of games are receiving “digital-only” releases.⁶⁸

In this new digital-only environment, many game developers have shifted from a “games as product” approach to a “games as service” approach.⁶⁹ Unlike with the “games as product” approach, where a purchaser has access to the entire game out of the box and never needs to worry about whether they have an internet connection, the games as service model relies on web-based infrastructure so that games can be “continuously updated.”⁷⁰ Under the games as service model, the content of a single game can drastically morph and shift over time, and access to all or a portion of the game may rely on a steady internet connection—but once the servers providing that content are taken down, all of that content essentially disappears.⁷¹ A popular element of this approach includes “server-side authentication,” which requires a game to connect to the developer’s server in order to run.⁷² Once the authenticating server is taken down, the game can be rendered unplayable or certain portions of the game may become unavailable.⁷³

Even if a buyer opts for a physical copy of a single-player game with no meaningful network features, the games as service model means that many of

⁶⁷ See *Buying Digital: The Games You Want, When You Want Them*, NINTENDO, <https://www.nintendo.com/games/buy-digital> [<https://perma.cc/PBT3-VQD4>]; *Games*, PLAYSTATION STORE, <https://store.playstation.com/> [<https://perma.cc/8NFP-3UXZ>]; *Xbox One Games Catalog*, XBOX, <https://www.xbox.com/en-us/games/xbox-one> [<https://perma.cc/L3XH-2HS5>].

⁶⁸ In response, this trend of digital-only releases has led to a paradoxical cottage industry of small print publishers producing limited physical releases of many of the more popular digital-only digital games. See, e.g., *About SRG*, SPECIAL RES. GAMES, <https://specialreservegames.com/pages/about-us> [<https://perma.cc/64LB-GPBA>]; *About Us*, LIMITED RUN GAMES, <https://limitedrungames.com/pages/about-us> [<https://perma.cc/UZB3-T2ZH>].

⁶⁹ Chris Kerr, *Games as a Service Drives Huge Market Value Spike for EA, Activision*, GAMASUTRA (Oct. 19, 2018), https://www.gamasutra.com/view/news/328999/Games_as_a_service_drives_huge_market_value_spike_for_EA_Activision.php [<https://perma.cc/CCA3-352B>] (showing that this approach to games as service “has been fueling growth over the past six years” with major publishers).

⁷⁰ MCV Staff, *Games as a Service: What Does It Mean for Indies?*, MCV (Mar. 3, 2014), <https://www.mcvuk.com/development/games-as-a-service-what-does-it-mean-for-indies> [<https://perma.cc/K3GP-SF2H>].

⁷¹ See *id.*; Kyle Orland, *Game Industry Pushes Back Against Efforts to Restore Gameplay Servers*, ARS TECHNICA (Feb. 21, 2018), <https://arstechnica.com/gaming/2018/02/preservation-or-theft-historians-publishers-argue-over-dead-game-servers/> [<https://perma.cc/M78X-5R23>] (covering the industry’s resistance to consumer created workarounds for such servers, even after the official servers have been taken down).

⁷² DIGITAL RIGHTS MANAGEMENT: THE LIBRARIAN’S GUIDE 54 (Catherine A. Lemmer & Carla P. Wale eds., 2016); Orland, *supra* note 71.

⁷³ Orland, *supra* note 71.

the games on the shelves today are unfinished products. As of this generation, even physical copies of major releases are frequently incomplete and require “Day-One patches” to finish features or fix major bugs.⁷⁴ Some games may even lack major story elements which need to be patched in.⁷⁵ Any archive that simply preserves a physical copy of a modern game—or the code copied from that physical copy—may only hold a fragment of the complete game. If and when the online services providing the necessary patches and downloadable content disappear, those parts of the game will no longer be accessible, and the copies held in archives will be forever be incomplete or even inoperable.

III. THE CHALLENGES FACING GAME PRESERVATION

The challenges facing digital game preservation can be sorted into two major categories. The first are the technical issues necessitating preservation in the first place, stemming largely from media degradation and obsolescence. These are the harsh physical truths that, without intervention, can eventually render games unplayable. The second category stems from the legal impediments that prevent or complicate preservation, often stemming from industry stances and practices either directly or indirectly adverse to preservation efforts.

A. *Technical Challenges and the Need for Preservation*

1. *Media Degradation*

Time will take its toll on all things, and the media used to store the code of digital games is no exception. For the most part, digital games—especially older games—were not designed to last forever.⁷⁶ Game cartridges⁷⁷ are subject to corrosion from moisture and battery acid, while optical media⁷⁸ can be rendered

⁷⁴ See Rami Ismail, *Why ‘Day-One Patches’ Are So Common*, KOTAKU (Aug. 8, 2016), <https://kotaku.com/why-day-one-patches-are-so-common-1784967193> [<https://perma.cc/UHQ7-XASC>] (presenting one game developer’s insight into the many reasons why modern games go to print before they are technically finished); see also, e.g., Owen S. Good, *No Man’s Sky’s Day-One Patch, Available Now, Dramatically Changes the Entire Game (Update)*, POLYGON (Aug. 7, 2016), <https://www.polygon.com/2016/8/7/12397380/no-mans-sky-day-one-patch> [<https://perma.cc/5HUF-9F66>] (describing how, immediately upon release, the intensely hyped *No Man’s Sky* required an update that overhauled nearly every aspect of the game).

⁷⁵ See, e.g., Jason Schreier, *Kingdom Hearts III’s Epilogue Will Be Patched in After Launch*, KOTAKU (Jan. 11, 2019), <https://kotaku.com/kingdom-hearts-iiiis-epilogue-will-be-patched-in-after-1-1831669786> [<https://perma.cc/P6U3-CLR6>] (reporting that several parts of *Kingdom Heart’s III’s* story were to be patched in after release).

⁷⁶ See *supra* Part II.

⁷⁷ See *supra* Part II.B for a brief description and history of programmable cartridges.

⁷⁸ See *supra* Part II.C for a brief description and history of games on optical media.

unreadable by pits, scratches, and chemical damage from inks, adhesives, and other materials.⁷⁹ But beyond just simple wear and tear, different storage mediums have different lifespans, and each has an expiration date, after which the data stored on them becomes lost or unreadable.⁸⁰

Games stored on cartridges face what is referred to as “bit rot.”⁸¹ Over time, the individual bits of data stored on the ROM chips that hold the game’s code can “flip,”⁸² resulting in the “gradual and natural decay” of the data over time, which can then render the game unplayable.⁸³ How quickly bit rot occurs in cartridges depends on the type of ROM used.⁸⁴ Most “masked ROM” cartridges are relatively safe from bit rot, and while the general lifespan of masked ROM chips is unknown, it is expected that many will outlive the copyrights preventing their legal duplication.⁸⁵ On the other hand, cartridges using “EPROM” (Erasable Programmable ROM) only have an expected lifespan of twenty-five years, with many of the earliest EPROM cartridges already showing signs of bit rot.⁸⁶

Optical media faces its own version of bit rot in the form of “disc rot.”⁸⁷ Disc rot can come in several forms, including the appearance of pin-hole specks in the data layer of the disc, “edge-rot,” and “bronzing”—each of which can quickly render a disc unreadable.⁸⁸ While the prevalence of disc rot varies depending on manufacturing techniques and environmental factors, older discs

⁷⁹ Devin Monnens, *Losing Digital Game History, Bit by Bit*, in *BEFORE IT’S TOO LATE*, *supra* note 18, at 142.

⁸⁰ For a general ranking of how long different media formats are expected to last before becoming unreadable, see *Media Stability Rankings*, MUSEUM OBSOLETE MEDIA, <https://obsoletemedia.org/media-preservation/media-stability-ratings/> [<https://perma.cc/GNW6-9ANB>].

⁸¹ Jim Salter, *Bitrot and Atomic COWs: Inside “Next-Gen” Filesystems*, ARS TECHNICA (Jan. 15, 2014), <https://arstechnica.com/information-technology/2014/01/bitrot-and-atomic-cows-inside-next-gen-filesystems/> [<https://perma.cc/PU2B-SHYL>].

⁸² *Id.*

⁸³ Monnens, *supra* note 79, at 141.

⁸⁴ *Id.*

⁸⁵ *Id.* at 142.

⁸⁶ *Id.* at 142–43. A rare smattering of arcade games also has a security feature which places some code on battery-powered SRAM, causing the game to “commit suicide” once the battery eventually dies. *Id.*

⁸⁷ Ernie Smith, *When Discs Die*, TEDIUM (Feb. 2, 2017), <https://tedium.co/2017/02/02/disc-rot-phenomenon/> [<https://perma.cc/83FZ-EWGZ>]; see also Laura Sydell, *How Long Do CDs Last? It Depends, but Definitely Not Forever*, NPR (Aug. 18, 2014), <https://www.npr.org/sections/alltechconsidered/2014/08/18/340716269/how-long-do-cds-last-it-depends-but-definitely-not-forever> [<https://perma.cc/CT4G-KJWT>] (discussing how many archives that use CDs for data storage, including the Library of Congress, are beginning to experience issues with both “CD rot” and “bronzing”).

⁸⁸ Smith, *supra* note 87.

seem to be especially at risk, with Sega CD (1992), Sega Saturn (1995), and even Sega Dreamcast (1999) games already beginning to show signs of rot.⁸⁹

2. *Obsolescence*

As technology moves ever forward, digital game preservation also faces the threats and complications of technological obsolescence.⁹⁰ Even without the threat of media degradation, a game's data can rapidly become unplayable in the latest hardware and software environments.⁹¹ Meanwhile, "the high costs of maintenance and inevitable failure of computer components" makes the long-term preservation of most old hardware unfeasible.⁹² A long-term preservation strategy must consider the challenges posed not just by the hardware and software environments of the next few years, but the hardware and software environments decades or even centuries down the line.

To combat obsolescence, many archivists argue that source code is vital for long-term preservation.⁹³ For preservation purposes, the source code of a digital game is the "equivalent of the original camera negative of a film"⁹⁴ or a digital "manuscript."⁹⁵ The source code contains the raw assets of the game itself and

⁸⁹ *Id.*

⁹⁰ Monnens, *supra* note 79, at 146.

⁹¹ *Id.* at 143 (finding that "[d]igital games are particularly susceptible to media obsolescence" due to the rapid evolution of technology and general lack of backwards compatibility between home consoles); see also Matt Bertz, *The Digital Archaeologists: How GOG.com Rescues Games from the Dustbin of History*, GAMEINFORMER (Mar. 7, 2019), <https://www.gameinformer.com/2019/03/07/the-digital-archaeologists-how-gog-com-rescues-games-from-the-dustbin-of-history> [<https://perma.cc/L5CH-34HN>] (reporting on Good Old Games (GOG), a company that focuses on the preservation and sale of computer games from the '80s and '90s; GOG employs a team of experts to update each game to run on new computers and claims that "for the more complicated titles, the [modernization] process can take up to six months").

⁹² Monnens, *supra* note 79, at 144.

⁹³ LUCA TABORELLI ET AL., VIDEO GAMES YOU WILL NEVER PLAY 44 (2016) (quoting Jeremy Thackray, assistant curator at the Centre for Computing History, in an interview: "It's one thing to collect a retail copy of a game, but for long term preservation the source code is vital. Big museums are starting to latch on to this: the Museum of Modern Art in New York has made it a priority to collect source code for their design collections, for instance.").

⁹⁴ Interview with Dave Gibson, Processing Technician, Library of Cong., Moving Image Section (Mar. 18, 2016), <https://nodontdie.com/dave-gibson> [<https://perma.cc/M5GQ-85BD>] (presenting an interview with Dave Gibson, a processing technician for the Library of Congress Moving Image Section, who works with digital games).

⁹⁵ Doug Reside, *File Not Found: Rarity in an Age of Digital Plenty*, 15 RBM: J. RARE BOOKS, MANUSCRIPTS, & CULTURAL HERITAGE 68, 70 (2014) (discussing how source code can reveal important design decisions).

can facilitate adaptation from one software environment to the next without necessarily needing to replicate the original hardware environment.⁹⁶

Without source code, the only other option for preservation in new hardware and software environments is to create “emulators” to replicate the original systems.⁹⁷ Emulators are pieces of software which attempt to mimic the physical hardware of a specific console or computer system.⁹⁸ Essentially, they are programs pretending to be physical devices.⁹⁹ Building effective emulators is difficult and even when they manage to run a game, there can often be severe technical issues.¹⁰⁰ The development process is further complicated by the fact that “the exact specifications of console video game systems and development documentation for game developers are usually confidential,” meaning that emulator developers are often flying in the dark.¹⁰¹ Cartridge-based games can further complicate matters if the cartridge itself contains special hardware that also needs to be separately emulated or otherwise accounted for.¹⁰²

The digital games industry is often very protective of source code and trade secrets laws often keep source code from ever reaching the public.¹⁰³ Despite this, many individual publishers and developers do not take good care of their source code, and there have already been cases of major publishers losing the source code to high-profile games and severely hindering even their own ability

⁹⁶ See Trevor Owens, *Duke’s Legacy: Video Game Source Disc Preservation at the Library of Congress*, LIBR. CONGRESS (Aug. 6, 2014) (reporting on the accidental submission of the source code of an unreleased game to the Library of Congress and the process taken to access the game’s data); see also Alexandra J. Horne, Comment, *Shared Rights to Source Code: The Copyright Dilemma*, 32 SANTA CLARA L. REV. 497, 505 (1992) (“A computer software program is developed by a human being . . . using source code. Although source code is understandable to a human, it is not intelligible to a computer. Therefore, in a simplified case, a two-step process is used to translate the source code into a machine-readable, binary language of ones and zeros.”).

⁹⁷ See Sho Kikugawa, *How Emulators Work*, PC GAMER (Feb. 5, 2016), <https://www.pcgamer.com/how-emulators-work/> [<https://perma.cc/A367-Q5S9>] (explaining the basic technical aspects of emulators).

⁹⁸ Michael Wahba, *The Bits and Bytes of Video Game Preservation*, SCHOLARLY GAMERS (Nov. 9, 2018), <https://www.scholarlygamers.com/feature/2018/11/09/the-bits-and-bytes-of-video-game-preservation/> [<https://perma.cc/6ECD-WTE5>].

⁹⁹ *Id.*

¹⁰⁰ See Charlotte Thai, *How to Give Cartridge-Based Video Game Data an Extra Life*, HOW THEY GOT GAME (Oct. 24, 2013), <http://web.stanford.edu/group/htgg/cgi-bin/drupal/?q=node/1179> [<https://perma.cc/BZT5-YSHQ>] (presenting some of the technical issues faced when attempting to archive and emulate cartridge-based games from the Cabrinity Collection); see also Wahba, *supra* note 98 (“[A]s consoles get more and more complex, developing emulators similarly requires much more work.”).

¹⁰¹ Guttenbrunner et al., *supra* note 31, at 72–73 (also noting that “[w]ithout the support of the manufacturer, it can be difficult to preserve a video game of a particular system”).

¹⁰² See, e.g., Orland, *supra* note 39 (noting the difficulties posed by emulating SNES games that used the SuperFX chip).

¹⁰³ See *infra* Part III.B.2.

to adapt a game from a single generation of consoles to the next.¹⁰⁴ While there is evidence that many of the largest developers and publishers have processes for preserving their own source code,¹⁰⁵ even the most successful companies cannot be expected to last forever, and such preservation may not always survive the sale or dissolution of a company.¹⁰⁶ Further, as leadership changes, executives of larger game companies may not always respect or understand the value of preserving their back catalogue—especially when there may be no profit motive in preservation.¹⁰⁷ Meanwhile on the smaller end of the

¹⁰⁴ See, e.g., Anthony John Agnello, *The Problem with Preservation*, IUP (May 14, 2012), <https://web.archive.org/web/20150606214308/http://www.iup.com/features/the-problem-with-preservation> [<https://perma.cc/XR2Z-H559>] (revealing that game publisher Konami lost the final source code to seminal survival horror games *Silent Hill 2* and *Silent Hill 3*, one of many factors leading to the buggy and widely criticized HD remakes only a single console generation after their original releases); Alex Donaldson, *Why Isn't There a PS4, Xbox and Switch Port of Final Fantasy 8? Preservation May Be the Answer*, VG247 (Sept. 14, 2018), <https://www.vg247.com/2018/09/14/isnt-ps4-xbox-switch-port-final-fantasy-8-preservation-may-answer/> [<https://perma.cc/638F-TPVS>] (describing how the major developer Square (now Square Enix) lost the source code to *Final Fantasy VII*, a popular and massively successful entry in their flagship franchise, almost immediately after development. This greatly hindered their ability to port the game to personal computers (PCs) only a year after the initial release. After they rebuilt much of the game for the PC release, that new source code was also lost, meaning they had to “reverse-engineer and frankenstein” the game once again to release it for modern consoles); Chris Kerr, *Square Enix Working to Preserve and Release Entire Game Library*, GAMASUTRA (June 13, 2019), https://www.gamasutra.com/view/news/344710/Square_Enix_working_to_preserve_and_release_entire_game_library.php [<https://perma.cc/HGQ9-G6ZH>] (quoting Square Enix president and chief executive, Yosuke Matsuda: “[I]n some cases, we don’t know where the code is anymore. . . . [B]ack in the day you just made [games] and put them out there and you were done—you didn’t think of how you were going to sell them down the road. . . . Sometimes customers ask, ‘Why haven’t you released that [game] yet?’ And the truth of the matter is it’s because we don’t know where it has gone.”).

¹⁰⁵ John Andersen, *Where Games Go to Sleep: The Game Preservation Crisis, Part 3*, GAMASUTRA (Mar. 10, 2011), http://www.gamasutra.com/view/feature/134671/where_games_go_to_sleep_the_game_.php [<https://perma.cc/H92X-GDRE>] (indicating that developers such as the “big three” hardware giants, Sony, Nintendo, and Microsoft claim to have their own preservation strategies in place).

¹⁰⁶ See, e.g., *id.* (revealing that when Mattel shut down game production in 1984, it went out of its way to archive its source code in the hopes that they would find a buyer for Intellivision; only a year after the purchase, the buyer was unable to read the non-standard disks the code had been saved to, and the code had to be retrieved through a long process of acquiring old hardware and transferring the code to a new format); *7800 Games & Development*, ATARI MUSEUM, <http://www.atarimuseum.com/videogames/consoles/7800/games/> [<https://perma.cc/336J-KZZ8>] (explaining that much of the source code currently available for Atari 7800 games only exists because it was rescued from dumpsters behind Atari’s California office when Atari shut down in 1996).

¹⁰⁷ See, e.g., Matt Peckham, *Everything Sony Told Us About the Future of PlayStation*, TIME (June 5, 2017), <http://time.com/4804768/playstation-4-ps4-pro-psvr-sales/> [<https://perma.cc/N57U-EJFC>] (quoting Sony global sales chief Jim Ryan regarding the importance

development spectrum, many independent developers simply do not have the time or resources to devote to long-term preservation.¹⁰⁸

B. Legal Hurdles for Game Preservation

One of the unfortunate realities facing digital game preservation is how often the games industry itself stands in direct opposition to preservation efforts. While current copyright law is more favorable to game preservation than it has been in the past, the volatility of copyright law around archiving games still presents major issues. Meanwhile, trade secrets laws stand in the way of archiving source code, and the new model of “games as service” and “always on” DRM and server-side authentication present a host of new legal issues. One reaction to these hurdles has been a grassroots movement to preserve games through the private collection and distribution of ROMs—but such an approach provides unstable and uncertain results, in addition to its illegality.

1. Copyright

One of the legal hurdles to transferring games from a dying format to a more stable one is the Digital Millennium Copyright Act of 1998 (DMCA).¹⁰⁹ One of the DMCA’s main functions regarding digital games is to prevent users from circumventing the devices that copyright holders use to protect games from unauthorized copying.¹¹⁰ However, even if an archive looking to transfer game data off of dying media had the time and resources to formally reach out and request permission from each and every rightsholder (and optimistically assuming that the rightsholders would always be willing to grant such

of backwards compatibility: “I was at a *Gran Turismo* event recently where they had PS1, PS2, PS3 and PS4 games, and the PS1 and the PS2 games, they looked ancient, like why would anybody play this?”); see also Lewis Gordon, *Beware the Corporate Video Game Canon*, AV CLUB (Nov. 29, 2018), <https://games.avclub.com/beware-the-corporate-video-game-canon-1830684470> [<https://perma.cc/8CG4-L8Y3>] (discussing how game manufacturers benefit from perpetuating a culture of planned obsolescence and restrictive IP laws that prevent public access to the history of digital games, and arguing that within Nintendo and Sony’s attempts to financially capitalize on growing public interest in their back catalogues, “[t]he vast majority of the quirks, experiments, and other cultural artifacts that fail to meet Sony’s and Nintendo’s own teleological narratives have been scrubbed out of their histories”).

¹⁰⁸ See TABORELLI ET AL., *supra* note 93, at 66 (quoting journalist and game historian, John Anderson: “Many developers and publishers care about their legacies, but the feeling I got from indie developers was ‘We have to worry about right now, not the past.’ I think that echoes to major developers and publishers as well since this is understandably (and obviously) such a competitive industry.”).

¹⁰⁹ Digital Millennium Copyright Act of 1998, Pub. L. No. 105-304, 112 Stat. 2860.

¹¹⁰ ASHLEY SAUNDERS LIPSON & ROBERT D. BRAIN, *VIDEOGAME LAW: CASES, STATUTES, FORMS, PROBLEMS & MATERIALS* 292–94 (2d ed. 2016).

permission),¹¹¹ archives would still struggle with a number of games where identifying and locating the rightsholders decades after its release is virtually impossible.¹¹²

Fortunately, a DMCA exemption currently allows libraries, archives, and museums to circumvent technological copyright protection measures for games that are “no longer reasonably available in the commercial marketplace, solely for the purpose of preservation of the game in a playable form”¹¹³—but that exemption remains vulnerable and faces continuous pushback from industry organizations. Exemptions to the DMCA must be renewed every three years,¹¹⁴ leading to inconsistency and uncertainty. Prior to 2018, these exemptions had to be reestablished *de novo* after each three-year period, but as of October 2018, the U.S. Copyright Office streamlined the proceedings to allow for the automatic renewal of exemptions “to which there is no meaningful opposition.”¹¹⁵

The exemption for archives, libraries, and museums was first introduced in 2003.¹¹⁶ It disappeared in 2010, replaced with an exemption for “good faith testing, investigating, or correcting security flaws or vulnerabilities.”¹¹⁷ In 2012, there were absolutely no exemptions for digital games¹¹⁸ in the wake of the Electronic Frontier Foundation’s (EFF) failed effort to obtain an exception for circumvention of access controls on game consoles.¹¹⁹ This was largely a result of “vigorous” opposition from the Entertainment Software Association

¹¹¹ See Bertz, *supra* note 91 (finding that rightsholders are often uncooperative even when presented with financial incentives, pointing to diverse issues including “[b]itter divorcees uninterested in propping up their former partner’s legacy, relatives who have little to no interest in video games, and people too rich to bother”).

¹¹² See *id.* (noting that digital game licensing rights “are inherently transitory; the further you get from the date of the original release, the more likely you’re going to run into a roadblock as companies close, creators die, and paper trails disappear.” In covering Good Old Games (GOG), a company that focuses on the preservation and sale of computer games from the ‘80s and ‘90s, Bertz found that “[i]n extreme cases, GOG has hired private investigators to help track down rights owners” and that for some games, “[f]inding out who has the rights can be impossible.”).

¹¹³ 37 C.F.R. § 201.40(b)(12)(ii) (2019).

¹¹⁴ Sarah Jeong, *Why DMCA Rulemaking Is an Unsustainable Garbage Train*, VICE (Nov. 3, 2015), https://www.vice.com/en_us/article/9a33wv/why-dmca-rulemaking-is-an-unsustainable-garbage-train [<https://perma.cc/DXH7-GLLS>] (covering how the triennial exemption process not only hinders game preservation but also disrupts security research).

¹¹⁵ Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies, 83 Fed. Reg. 54,010, 54,011 (Oct. 26, 2018).

¹¹⁶ 37 C.F.R. § 201.40(b)(3) (2003) (expired 2006).

¹¹⁷ 37 C.F.R. § 201.40(b)(4) (2010) (expired 2012).

¹¹⁸ See 37 C.F.R. § 201.40 (2012) (expired 2014).

¹¹⁹ See Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies, 77 Fed. Reg. 65,260, 65,272–74 (Oct. 26, 2012).

(ESA).¹²⁰ An exemption was not reintroduced until 2015 to allow circumvention of authentication servers that had been taken down.¹²¹ This new exemption also faced resistance by the ESA.¹²² Finally, the current exemption allowing approved libraries, archives, and museums to circumvent copy protection for the preservation of digital games was reintroduced in October 2018—eight years after it had disappeared.¹²³ This newest exemption also faced opposition when it was presented alongside a more general exemption for computer software, with opponents claiming that the overall proposal was “overbroad.”¹²⁴ In 2021, the current exemption may again have to be reconsidered if the ESA or other groups oppose it, which would mean that preservationists could once again have to put valuable time and resources into retaining the exemption or else be thrust back into a complicated, legal grey space.¹²⁵

This legal uncertainty and adversarial positioning towards the industry is not conducive to long-term preservation efforts. At the moment, the Library of Congress does not transfer games off of their original media and seems to be nervous about doing so.¹²⁶ However, some archives have begun to back up certain games. The Stephen M. Cabrinety Collection at Stanford University is in the process of ripping ROM files and ISOs for digital preservation,¹²⁷ focusing on software from 1975 to 1995.¹²⁸ Even further along the spectrum is

¹²⁰ *Id.* The ESA is the leading digital games industry association in the United States. See *2019 Essential Facts About the Computer and Video Game Industry*, ENT. SOFTWARE ASS’N, <http://www.theesa.com/esa-research/2019-essential-facts-about-the-computer-and-video-game-industry/> [<https://perma.cc/FSF6-UF6R>]. One of their primary goals is to promote “strong intellectual property protection and enforcement rights” to protect member company content. *Intellectual Property*, ENT. SOFTWARE ASS’N, <http://www.theesa.com/public-policy/intellectual-property/> [<https://perma.cc/99W6-64EP>].

¹²¹ 37 C.F.R. § 201.40(b)(8)(i) (2015) (allowing circumvention “when the copyright owner or its authorized representative has ceased to provide access to an external computer server necessary to facilitate an authentication process to enable local gameplay”).

¹²² Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies, 80 Fed. Reg. 65,944, 65,957 (Oct. 28, 2015) (stating that the ESA argued that the proposed exemption “was too broad, would not facilitate any noninfringing uses, and could adversely impact the market for video games”).

¹²³ 37 C.F.R. § 201.40(b)(12) (2019).

¹²⁴ Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies, 83 Fed. Reg. 54,010, 54,023 (Oct. 26, 2018).

¹²⁵ Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies, 83 Fed. Reg. at 54,011 (allowing for the automatic renewal of DMCA exceptions unless there is “meaningful opposition”).

¹²⁶ See Interview with Dave Gibson, *supra* note 94 (“[R]ight now, at least the Library of Congress, we’re not going down the emulation road at all for a number of reasons, the main one being that the fact is copyright and we share—we’re under one roof together.”).

¹²⁷ See Thai, *supra* note 100 (presenting the “method for retrieving forensically viable data from cartridge-based media in the Cabrinety collection”).

¹²⁸ *Cabrinety-NIST Project*, STAN. LIBR., <https://library.stanford.edu/projects/cabrinety-nist-project> [<https://perma.cc/7UG8-JCG5>].

the Internet Archive, which has long claimed that copyright law allows it to archive game software¹²⁹ and which also openly hosts a prodigious amount of copyrighted games for public use.¹³⁰ The legality of some of the Internet Archive's actions remains in question¹³¹ despite the organization's ties to the Library of Congress,¹³² and it is worth noting that the Internet Archive has openly broken other, similar copyright laws for long periods of time.¹³³ As long as the legality of these and other preservation efforts remain in question or could be undone by future changes to the exceptions, long-term game preservation stands on shaky grounds, and many archives may simply not wish to take on the legal risks without the explicit approval of rightsholders.

2. Source Code and Trade Secret Law

Frequently, companies seek to protect source code via trade secret law.¹³⁴ However, the very nature of trade secret law requires companies to ensure that people outside of the company do not have access to the source code. Under the Uniform Trade Secrets Act (UTSA), secrets are "entitled to indefinite protection

¹²⁹The Internet Archive, Comment Letter on Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies 7–9 (Dec. 1, 2005), https://cdn.loc.gov/copyright/1201/2006/comments/kahle_internetarchive.pdf [<https://perma.cc/CX34-VWNH>] (arguing that their archiving of digital games constitutes non-infringing use under Sections 108, 117(a)(2), and 107 of the Copyright Act).

¹³⁰See, e.g., *Internet Arcade*, INTERNET ARCHIVE, <https://archive.org/details/internet-arcade> [<https://perma.cc/CRB7-XZYV>] (allowing users to play many copyrighted arcade games from their browsers, including Sega's *Out Run*, Atari's *The Empire Strikes Back*, and Capcom's *Street Fighter II*).

¹³¹See Dan Whitehead, Opinion, *We Need to Talk About Emulation*, EUROGAMER (May 31, 2015), <https://www.eurogamer.net/articles/2015-05-31-we-need-to-talk-about-emulation> [<https://perma.cc/4DUU-2BWK>] (arguing that despite the value that the Internet Archive provides, the community around digital games must sooner or later talk about the obvious copyright violations involved).

¹³²See, e.g., *Library of Congress, Internet Archive, Webarchivist.org and the Pew Internet & American Life Project Announce Sept. 11 Web Archive*, LIBR. CONGRESS (Oct. 11, 2001), <https://www.loc.gov/item/prn-01-150/sept-11-web-archive-announced/2001-10-11/> [<https://perma.cc/8MP4-ZYZN>].

¹³³See Nate Hoffelder, *SFWA Finally Notices Internet Archive's Decade Old Open Library, Decides It's Piracy*, DIGITAL READER (Jan. 9, 2018), <https://the-digital-reader.com/2018/01/09/sfwa-finally-notices-internet-archives-decade-old-open-library-decides-piracy/> [<https://perma.cc/URG3-PS5U>] (covering the recent legal issues surrounding the Internet Archive's decade old Open Library, "where members can borrow digital copies of the print books that either the IA has archived in its warehouses, or a partner library has in its catalog").

¹³⁴See Belinda M. Juran, *Trade Secret Protection for Source Code*, WILMERHALE (July 17, 2001), <https://www.wilmerhale.com/en/insights/publications/trade-secret-protection-for-source-code-july-17-2001> [<https://perma.cc/QS22-DUAR>] (describing source code as the "crown jewels" of many companies). Cf. generally Horne, *supra* note 96 (arguing that source code would be better protected under a copyright regime).

as long as [they are] kept a true secret.”¹³⁵ Over forty-five states have adopted the UTSA,¹³⁶ which defines a trade secret as:

[I]nformation, including a formula, pattern, compilation, program, device, method, technique, or process, that: (i) derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use, and (ii) is the subject of efforts that are reasonable under the circumstances to maintain its secrecy.¹³⁷

When considering whether particular information is a trade secret, three of the major factors a court will consider are (1) the extent to which the information is known outside the business, (2) the extent of measures taken to guard the secrecy of the information, and (3) the difficulty with which others could acquire the information.¹³⁸

Companies often go to great lengths to ensure that their trade secrets remain confidential.¹³⁹ If they succeed, one of the major benefits of trade secret protection to rightsholders (and one of the hurdles to preservationists) is that trade secret protection truly can be indefinite—so long as the secret is kept from the public, protection will not expire with time.¹⁴⁰

For these reasons, it is easy to understand why companies would be nervous about sharing their source code with archives and potentially losing their trade secret protection. Any long-term preservation strategy wishing to gain the cooperation of the digital games industry will need to work with companies to guarantee that any archived source code is kept sufficiently secret, at least so long as the source code remains meaningfully valuable to those companies.

3. DRM and Server-Side Authentication

The shift to digital distribution and “games as service” presents a host of new legal issues in game preservation¹⁴¹ and may mean that many newer “digital-only” games that are never released on physical media may be at a

¹³⁵ Methenitis, *supra* note 22, at 11.

¹³⁶ AM. BAR ASS’N, LEGAL GUIDE TO VIDEO GAME DEVELOPMENT 27 (Ross Dannenberg ed., 2d ed. 2011).

¹³⁷ UNIF. TRADE SECRETS ACT § 1(4) (NAT’L CONFERENCE OF COMM’RS ON UNIF. STATE LAWS 1985).

¹³⁸ AM. BAR ASS’N, *supra* note 136, at 28.

¹³⁹ See *id.* at 29–30 (suggesting that companies hoping to protect their trade secrets restrict disclosure to necessary personnel, use employee nondisclosure agreements, and implement secure record keeping procedures).

¹⁴⁰ *Patents or Trade Secrets?*, WORLD INTELL. PROP. ORG., https://www.wipo.int/sme/en/ip_business/trade_secrets/patent_trade.htm [<https://perma.cc/4R6F-WCNX>].

¹⁴¹ See *supra* Part II.D for a brief description of the concept of “games as service.”

paradoxically greater risk of being lost than many older games.¹⁴² Further, games that require a connection to a developer or publisher's server to function or access certain features can quickly be rendered nonfunctional or incomplete once those servers are taken down.¹⁴³ While this is already a large technical hurdle for preservation of many modern games, it is further complicated by additional legal hurdles.

A recent decision by the Librarian of Congress allows museums and archives to recreate servers for games after the official servers have been taken down, but only if (1) the museum or archive legally obtains the original server code (2) the museum does so without the purpose of obtaining a commercial advantage, and (3) the servers are only locally accessible on the museum or archive's premises.¹⁴⁴ Because of this, emulation or "reconstruction" of server code is not currently a valid exception to the DMCA.¹⁴⁵ However, it is rare for companies to make server code available and the original server code is often lost as soon as a company takes the servers down, making this provision effectively useless in most cases.¹⁴⁶

¹⁴² See, e.g., Steve Hannley, *Scott Pilgrim vs. The World: The Game Delisted from Xbox Live and PSN*, *HARDCORE GAMER* (Dec. 30, 2014), <http://www.hardcoregamer.com/2014/12/30/scott-pilgrim-vs-the-world-the-game-delisted-from-xbox-live-and-psn/126681/> [<https://perma.cc/Y3W2-67VG>] (covering the delisting of the digital-only game *Scott Pilgrim vs. The World: The Game* from distribution platforms, making it essentially unobtainable for anyone who had not already downloaded it); Chris Kohler, *The Best WiiWare Games to Buy Before They All Disappear*, *KOTAKU* (Jan. 28, 2019), <https://kotaku.com/the-best-wiiware-games-to-buy-before-they-all-disappear-1820808421> [<https://perma.cc/2KD8-4VXF>] (listing many of the digital-only games that became unobtainable after Nintendo discontinued the Wii's digital storefront); Kyle Orland, *End of Ferrari Deal Pulls Sega's OutRun Online Arcade from XBLA, PSN*, *GAMASUTRA* (Oct. 12, 2010), http://www.gamasutra.com/view/news/30919/End_Of_Ferrari_Deal_Pulls_Segas_OutRun_Online_Arcade_From_XBLA_PSN.php [<https://perma.cc/VGZ8-ZN6L>] (covering the delisting of digital-only game *OutRun Online Arcade* from distribution platforms following the "expiration of a licensing deal with Ferrari"). See generally *Latest Additions & Site Intro*, *DELISTED GAMES*, <https://delistedgames.com/> [<https://perma.cc/7HSM-32BD>] (tracking games that have been removed from digital distribution services).

¹⁴³ See *supra* Part II.D.

¹⁴⁴ Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies, 83 Fed. Reg. 54,010, 54,024–25 (Oct. 26, 2018) (codified at 37 C.F.R. pt. 201); 37 C.F.R. § 201.40(b)(12)(i)(B) (2019).

¹⁴⁵ Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies, 83 Fed. Reg. at 54,024; 37 C.F.R. § 201.40(b)(12)(iv)(A) (2019) (defining "complete games" for purposes of this regulation as those "that can be played by users without accessing or reproducing copyrightable content stored or previously stored on an external computer server").

¹⁴⁶ Ian Birnbaum & Matthew Gault, *Copyright Law Just Got Better for Video Game History*, *VICE* (Oct. 25, 2018), https://www.vice.com/en_us/article/zm9az5/copyright-law-just-got-better-for-video-game-history [<https://perma.cc/R66X-234A>] (quoting John Hardie, Director of the National Videogame Museum in Frisco, Texas: "It's very unlikely that anyone saved the server code . . . In all the archiving we've done, we've never had a

This is another situation where the collaboration between rightsholder and preservationist is critical to long-term preservation. Not only does the law need to change to allow for circumvention in cases where the server code has been lost, but there needs to be channels and agreed upon best practices for preserving server code in the first place. However, the current legal environment is unlikely to foster such collaboration. Even this small exception was resisted by the ESA who, alongside other opponents, “contended that proponents wish[ed] to engage in recreational play that could function as a market substitute.”¹⁴⁷

4. *What of Private Preservation Efforts?*

While many of the legal issues revolving around the private creation, consumption, and distribution of ROMs¹⁴⁸ fall outside the scope of this Note, it is sufficient to say that the private distribution of ROMs over the internet is “unambiguously illegal.”¹⁴⁹ However, it is worth briefly mentioning the grassroots efforts many individuals are making to preserve games through the admittedly illegal collection and distribution of ROMs.¹⁵⁰

Some have begun to argue that without legal alternatives, the illegal collection and distribution of ROMs is the only available method for comprehensive and long-term digital game preservation.¹⁵¹ In addition to its

company say to us, ‘here’s our server code’ . . . I’d say nine times out of ten, the server code has not been archived or saved. It just gets formatted, or whatever, or just discarded with the server.”); *see also* Guttenbrunner et al., *supra* note 31, at 74 (“[N]etwork protocols and necessary server software are not publicly available and only known by the manufacturer, so the risk of losing this information is very high.”).

¹⁴⁷ Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies, 83 Fed. Reg. at 54,024.

¹⁴⁸ Software that is extracted from a game’s original media and run on a computer emulator. *See supra* Part III.A.2 for a brief description of emulators.

¹⁴⁹ Justin Pot, *Is Downloading Retro Video Game ROMs Ever Legal?*, HOW-TO GEEK (Oct. 6, 2018), <https://www.howtogeek.com/262758/is-downloading-retro-video-game-roms-ever-legal/> [<https://perma.cc/F9AW-CQ8B>].

¹⁵⁰ *See, e.g.*, Justin Pot, *Why Are Video Game Emulators So Important? (Because They Preserve Our History)*, HOW-TO GEEK (Oct. 6, 2018), <https://www.howtogeek.com/347530/the-importance-of-emulation-for-games-preservation/> [<https://perma.cc/H8UK-DB44>] (admitting to the potential illegality of ROMs but arguing that they “help[] preserve history all the same”).

¹⁵¹ *See, e.g.*, Karl Bode & Emanuel Maiberg, *Nintendo Makes It Clear that Piracy Is the Only Way to Preserve Video Game History*, VICE (Jan. 29, 2019), https://motherboard.vice.com/en_us/article/wjm5kw/nintendo-makes-it-clear-that-piracy-is-the-only-way-to-preserve-video-game-history [<https://perma.cc/K7MH-45W6>] (arguing that, in the wake of Nintendo’s shut-down of the Wii Shop Channel service—the digital store for the Nintendo Wii—the only available ways to obtain copies of the games exclusive to the service are now impractical or illegal. The only hope is if a user has already downloaded the games to a Wii console, but “if whatever storage device users put them on is destroyed, they’ll lose them for

illegality, the major issue with this approach is the vulnerability of ROM sites to takedown notices and other legal action, as well as the tremendous legal and financial risks that such private preservationists might take on.¹⁵² This method also does nothing to ensure that source code will become more accessible, meaning that obsolescence and certain technical problems will remain pressing issues.¹⁵³ There is also the reality that much of this preservation is driven by individuals with nostalgic and personal attachments to the games they are preserving through these methods,¹⁵⁴ and it is impossible to say whether future generations will pick up the torch of private, illegal preservation or if all those ROMs will simply fade into obscurity.¹⁵⁵

Between the legal issues and the individual nature of private preservation, it is impossible to know how such methods will hold up over the generations. A more collaborative and institutional solution both respects rightsholders and encourages developers to take an active part in the preservation process. However, game developers and publishers should take note of this grassroots movement both as an indicator of general interest in game preservation and as an untapped market who may be willing to pay for games they would otherwise pirate due to inaccessibility.¹⁵⁶

good.”); Pot, *supra* note 150 (arguing that private video game collections are insufficient to ensure long-term preservation).

¹⁵² See, e.g., Wajeeh Maaz, *Couple Who Ran ROM Site to Pay Nintendo \$12 Million*, VICE (Nov. 13, 2018), https://motherboard.vice.com/en_us/article/bjezda/couple-who-ran-rom-site-to-pay-nintendo-dollar12-million [<https://perma.cc/P8L5-7PFS>] (discussing how emulator sites responded to Nintendo’s copyright infringement suit with a “swift purge of self-censorship”).

¹⁵³ See *supra* Parts III.A.2 & III.B.2 for discussion on source code.

¹⁵⁴ See Patrick O’Rourke, *Retro Video Game Collecting: An Industry Built on Nostalgia but Plagued by High Prices*, FIN. POST, <https://business.financialpost.com/technology/gaming/retro-video-game-collecting-an-industry-built-on-nostalgia-but-plagued-by-high-prices> [<https://perma.cc/BJ9M-5EQB>] (last updated Dec. 12, 2014) (noting that the growing market for retro games is driven largely by nostalgia); Pot, *supra* note 150 (noting that private collectors are often “[p]eople who obsessively scan eBay for obscure games, then buy and preserve them”).

¹⁵⁵ See Maaz, *supra* note 152 (arguing that Nintendo’s aggressive legal action against ROM and emulator sites has had a deterrent effect which “is swiftly eroding a large chunk of retro gaming”).

¹⁵⁶ For one exploration of this later idea, see generally Jethro Dean Lord IV, Comment, *Would You Like to Play Again? Saving Classic Video Games from Virtual Extinction through Statutory Licensing*, 35 SW. U. L. REV. 405, 405 (2006) (arguing that the digital games industry should “adopt the principle of compulsory licensing from the music industry and encourage Congress to pass legislation creating a statutory licensing system for video game ROMs”).

C. Current State of Game Preservation

Digital game preservation efforts are currently underway in some public and nonprofit archives, but the preservation movement has a long way to go. As of 2016, the Library of Congress had only approximately 3500 games in its archive.¹⁵⁷ The collection is comprised entirely of physical media, and the Library's preservation activities are limited to storing this media in temperature- and humidity-controlled environments.¹⁵⁸ Despite these controls, the games remain vulnerable to media degradation,¹⁵⁹ but the legal uncertainty surrounding extracting the data from the games for long-term preservation continues to prevent the Library of Congress from taking further steps.¹⁶⁰

In the United States, there are several nonprofit archives and museums that are also beginning to undertake the mission of long-term game preservation. Some of the major efforts include the Internet Archive,¹⁶¹ the Stephen M. Cabrinety Collection,¹⁶² and the Video Game History Foundation.¹⁶³ In addition to helping to clear legal hurdles in the way of preservation, a national board would present these individual programs with a centralized hub for coordination and the development of universal best practices.

IV. ESTABLISHING A FEDERALLY FUNDED PRESERVATION BOARD

When considering the preservation of digital games, it is important to remember that this is not the first time society has needed to consider whether to preserve the historical foundations of a new artistic medium and how to go about doing so. The history of film preservation presents a cautionary tale of just how quickly irreplaceable pieces of our culture and history can be lost when industry figureheads and legislators fail to take proper action. However, the eventual establishment of the National Film Preservation Board (NFPB) and the collaborative approach to film preservation in place today provides a framework

¹⁵⁷ Interview with Dave Gibson, *supra* note 94.

¹⁵⁸ *Id.*

¹⁵⁹ See *supra* Part II.A.

¹⁶⁰ See Interview with Dave Gibson, *supra* note 94 (stating that there are a number of reasons the Library of Congress has not pursued emulation as a preservation method, “the main one being . . . copyright”).

¹⁶¹ *The Internet Archive Software Collection*, INTERNET ARCHIVE, <https://archive.org/details/software> [<https://perma.cc/64K8-NMSF>] (providing the public direct access to many digital games—many of which are protected under copyright—through its “internet arcade”).

¹⁶² *Cabrinety-NIST Project*, *supra* note 128 (preserving a large collection of software from 1975–1995).

¹⁶³ *The VGHF Digital Library*, VIDEO GAME HIST. FOUND., <https://gamehistory.org/what-were-doing/> [<https://perma.cc/6MNS-VWNM>] (preserving the “artifacts related to the history of video games and video game culture” such as magazines, advertising materials, packaging, and other documentation).

for how to ensure the long-term preservation of digital games. By adopting the modern approach towards film preservation facilitated by the NFPB, digital games can avoid having to reinvent the wheel of media preservation and prevent the sort of losses presented by the early days of film.

A. *Film Preservation: A Case Study*

*“Making pictures is not like writing literature or composing music or painting masterpieces. The screen story is essentially a thing of today and once it has had its run, that day is finished. So far there has never been a classic film in the sense that there is a classic novel or poem or canvas or sonata. Last year’s picture, however strong its appeal at the time, is a book that has gone out of circulation.”*¹⁶⁴

—Drama critic Edwin Schallert in 1934

The failures of early film preservation present a cautionary tale about how easily the foundation of a new medium can be lost when creators, policymakers, and the public fail to take action. Like games, film is relatively young in comparison to most other major artistic mediums such as visual art¹⁶⁵ or literature.¹⁶⁶ Both games and film share features of both works of human expression and consumer products, and “are part of a broader media landscape that exists in the contested space between artistic freedom and economic incentives.”¹⁶⁷ And much like how early games established foundational

¹⁶⁴ DAVID PIERCE, *THE SURVIVAL OF AMERICAN SILENT FILMS: 1912–1929*, at 10 (Sept. 2013).

¹⁶⁵ See Christopher Joyce, *Indonesian Caves Hold Oldest Figurative Painting Ever Found, Scientists Say*, NPR (Nov. 7, 2018), <https://www.npr.org/2018/11/07/664850289/indonesian-caves-hold-oldest-figurative-paintings-ever-found-scientists-say> [<https://perma.cc/X3NV-J9VT>] (presenting the discovery of a 40,000-year-old cave painting).

¹⁶⁶ See Andrew George, *Introduction to THE EPIC OF GILGAMESH: THE BABYLONIAN EPIC POEM AND OTHER TEXTS IN AKKADIAN AND SUMERIAN* xiii, xvi (Andrew George trans., Penguin Books 1999) (noting that “[l]iterature was already being written down in Mesopotamia by 2600 BC”).

¹⁶⁷ Conway & deWinter, *supra* note 26, at 2.

standards and the design language of modern games,¹⁶⁸ the era of the American silent film “established the language of modern cinema.”¹⁶⁹

Each early film is a piece of our shared cultural history that we can never recapture, which makes the truth that much more difficult: Nearly all those films have vanished. Estimates vary, but around 90% of all American silent films and 50% of American sound films made before 1950 are irretrievably lost.¹⁷⁰ These early films were destroyed through a mixture of negligence, natural decomposition, and corporate policies that dictated the willful destruction of older films.¹⁷¹ All this is in spite of the fact that, even in the earliest days of film, voices from within the industry were already making the case for film preservation.¹⁷²

However, not all is doom and gloom. Today, film preservation is facilitated by collaboration between countless public and nonprofit archives and research centers both in the United States and around the world, including the Library of Congress, the Museum of Modern Art, the Academy Film Archive, the George Eastman House, and the UCLA Film & Television Archive.¹⁷³ Through collaboration between rightsholders, legislators, and public and nonprofit archives, we have made the decision to preserve this vital art form for future

¹⁶⁸ See TABORELLI ET AL., *supra* note 93, at 80 (interviewing game designer William Novak, who discussed the difficulty of figuring out how to deal with cameras in the development of early 3D games, and how Super Mario 64’s “simple, elegant, and intuitive” solution of dragging the camera behind the player character inspired other designers); *id.* at 37 (quoting game designer Art Min on building the controls for *System Shock*: “Configurable key controls were not common and we had this interesting gameplay with learning around corners. We were the first with that tech in games, so we didn’t have some thing [sic] we could model after.”).

¹⁶⁹ PIERCE, *supra* note 164, at 5.

¹⁷⁰ Dave Kehr, *Film Riches, Cleaned Up for Posterity*, N.Y. TIMES (Oct. 14, 2010), <https://www.nytimes.com/2010/10/15/movies/15restore.html> [https://perma.cc/EWT2-RM4F]; see also PIERCE, *supra* note 164, at 21 (“Only 14% of American silent feature films (1,575 of 10,919 titles) survive as originally released in complete 35mm copies. Another 11% (1,174) also survive in complete form, but in less-than-ideal editions—foreign release version or small gauge-formats such as 16mm.”). But compare ANTHONY SLIDE, NITRATE WON’T WAIT: FILM PRESERVATION IN THE UNITED STATES 5–6 (1992) (claiming that “[n]o one really knows just how many films have survived and how much has been lost,” and stating that the number of surviving films may be “a lot higher”).

¹⁷¹ PIERCE, *supra* note 164, at 22 (noting that MGM was the only major studio of the silent-film era that saw long-term value in preserving its entire library, whereas studios like Universal-International engaged in the “willful disposal” of its entire library).

¹⁷² See SLIDE, *supra* note 170, at 9–10 (presenting a 1906 editorial in industry magazines suggesting that, “[p]erhaps the day will come when motion pictures will be treasured by governments in their museums as vital documents in their historical archives”).

¹⁷³ See *Public Research Centers & Archives*, LIBR. CONGRESS, <https://www.loc.gov/programs/national-film-preservation-board/resources/public-research-centers-and-archives/> [https://perma.cc/DZ9E-PH2K] (“A comprehensive listing of Public Moving Image Archives and Research Centers from around the world.”).

generations. These modern efforts to preserve film present a hopeful foundation for how to approach game preservation.

1. *Early Film Preservation Efforts (Late 1800s–1988)*

As with games today,¹⁷⁴ the Library of Congress's early involvement with film was haphazard, characterized by fits and starts. The earliest films can be traced back to the 1870s-1880s.¹⁷⁵ In turn, one of the earliest known attempts at any sort of film preservation came in 1893, when one of Thomas Edison's assistants registered several "Kineographic Records" for copyright protection at the Library of Congress.¹⁷⁶ Those records were soon after lost.¹⁷⁷

Until the Townsend Act was passed in 1912,¹⁷⁸ motion pictures were not subject to copyright protection.¹⁷⁹ Instead, copyright owners had to register their films as paper-printed collections of still photographs, which were then held by the Library of Congress.¹⁸⁰ Despite the eventual change in the law, many copyright owners continued this practice of registering paper-printed stills as late as 1916.¹⁸¹ These paper prints were eventually sealed away in a vault, where they were left to mold until their rediscovery in the late 1930s.¹⁸²

After the Townsend Act, film companies began to submit actual nitrate film for copyright.¹⁸³ However, due in large part to the flammability¹⁸⁴ of the film, the Library of Congress would then return the reels themselves to the rightsholders and only retained "descriptive material" about the film.¹⁸⁵

¹⁷⁴ See *supra* Part III.C.

¹⁷⁵ WHEELER WINSTON DIXON & GWENDOLYN AUDREY FOSTER, A SHORT HISTORY OF FILM 4–5 (2008) (citing the earliest example of a "movie" being filmed as occurring in 1878, consisting of several frames of a horse galloping, shown in quick succession. Meanwhile, the "first truly portable moving picture camera" was invented in 1882).

¹⁷⁶ SLIDE, *supra* note 170, at 36.

¹⁷⁷ *Id.*

¹⁷⁸ Townsend Act, Pub. L. No. 62-303, 37 Stat. 488–90 (1912).

¹⁷⁹ Erin Allen, *Centennial of Cinema under Copyright Law*, LIBR. CONGRESS: BLOG (Oct. 12, 2012), <https://blogs.loc.gov/loc/2012/10/centennial-of-cinema-under-copyright-law/> [<https://perma.cc/7AKW-XT9T>].

¹⁸⁰ *Id.*

¹⁸¹ SLIDE, *supra* note 170, at 38.

¹⁸² *Id.* at 37–38.

¹⁸³ Allen, *supra* note 179.

¹⁸⁴ SLIDE, *supra* note 170, at 1, 3 (stating that nitrate film "had two major drawbacks (at least from today's viewpoint): it was highly flammable and it would eventually decompose. . . . Because nitrate film is chemically unstable, it is in a perpetual state of decomposition. Such decomposition may take less than two decades or more than two generations. . . . If kept at a low temperature and humidity, it can be stored safely and indefinitely.").

¹⁸⁵ Allen, *supra* note 179.

The earliest governmental efforts at preserving the film itself began in the mid-1920s.¹⁸⁶ This preservation was limited to news reels, government films, and other records of historical events, rather than what most people today would think of as “movies.”¹⁸⁷ In 1934, the National Archives and Records Service (NARS) was brought into being to establish policies and procedures for managing these records.¹⁸⁸

The preservation of films as we typically think of them did not get its start as a movement until the Museum of Modern Art began its film library in 1935.¹⁸⁹ The museum had considered engaging in film preservation efforts as early as 1929, but much as many today are still hesitant to grant the artistic merits of digital games, the museum’s trustees at the time were nervous about taking the “then-revolutionary step of endorsing motion pictures as an art form.”¹⁹⁰

It was not until 1942—nearly fifty years after accepting Thomas Edison’s Kineographic Records—that the Library of Congress first “recogniz[ed] the importance of motion pictures to the historical record,” and began to request the return of actual nitrate reels for “selected works, including films made before 1942.”¹⁹¹ After consideration of 4398 feature films, newsreels, documentaries, and other “short subjects,” the Library acquired and retained 971 total films in 1945.¹⁹² During that process, the Motion Picture Collection was established in 1944, and was later renamed the Motion Picture Division in 1946.¹⁹³

Unfortunately, this progress was short lived. In 1947, the Library of Congress ran afoul of the film industry when the Library suggested that it become involved in film distribution.¹⁹⁴ Much like how the modern games industry often works against digital game preservation efforts, claiming that preservation may “adversely impact the market for video games”¹⁹⁵ or “function as a market substitute,”¹⁹⁶ the film industry in 1947 felt threatened by the public having more open access to these older films.¹⁹⁷ In response, the film industry pressured the House Appropriations Committee to eliminate the Motion Picture

¹⁸⁶ SLIDE, *supra* note 170, at 26.

¹⁸⁷ *See id.*

¹⁸⁸ *Id.*

¹⁸⁹ *See id.* at 18 (“The serious work of film preservation in the United States can be dated from the founding of the Film Library of the Museum of Modern Art in 1935.”).

¹⁹⁰ *Id.*

¹⁹¹ Allen, *supra* note 179.

¹⁹² SLIDE, *supra* note 170, at 39.

¹⁹³ *Id.*

¹⁹⁴ *Id.* at 41.

¹⁹⁵ Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies, 80 Fed. Reg. 65,944, 65,957 (Oct. 28, 2015).

¹⁹⁶ Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies, 83 Fed. Reg. 54,010, 54,024 (Oct. 26, 2018).

¹⁹⁷ *See* SLIDE, *supra* note 170, at 41.

Division's funding.¹⁹⁸ Defunded, the Motion Picture Division was closed, its staff dismissed.¹⁹⁹ After the Division's closure, the films that the Library of Congress had already collected were only inspected "on a casual basis," and any that showed signs of deterioration were simply thrown away.²⁰⁰ Over the next decade, half of the films in the collection were lost.²⁰¹

The Library of Congress was not able to return in earnest to film preservation until 1965.²⁰² In 1968, the Library of Congress began a collaboration with the private American Film Institute (AFI) in order to obtain a "comprehensive collection of significant American films," renaming the Library's archive, the "American Film Institute Collection at the Library of Congress."²⁰³ This collaboration attempted to garner public interest in film preservation beginning in the early 1970s, but these early attempts were largely unsuccessful.²⁰⁴ The general public simply did not seem interested²⁰⁵—but that was about to change.

2. *Establishment of the National Film Preservation Board*

After facing a nearly a decade of public disinterest, the American Film Institute made a major publicity push for film preservation, declaring 1983–1993 to be "The Decade of Preservation."²⁰⁶ Rather than working against preservation efforts, the film industry threw its weight behind this new push, holding "star-studded" parties, raising hundreds of thousands of dollars in donations, and even drawing the attention and support of former film star President Ronald Reagan.²⁰⁷

The legislative result of this surge of attention was the 1988 Film Preservation Act.²⁰⁸ The Act explicitly recognized that films are "an indigenous American art form . . . emulated throughout the world," that they "represent an enduring part of our Nation's historical and cultural heritage," and that they are a "significant American art form deserving of protection."²⁰⁹ The Act directed the Librarian of Congress to establish the National Film Registry "for the purpose of registering films that are culturally, historically, or aesthetically

¹⁹⁸ *Id.*

¹⁹⁹ *Id.*

²⁰⁰ *Id.*

²⁰¹ *Id.*

²⁰² *Id.* at 42–43.

²⁰³ SLIDE, *supra* note 170, at 76–77.

²⁰⁴ *Id.* at 78.

²⁰⁵ *See id.*

²⁰⁶ *Id.* at 86.

²⁰⁷ *Id.* at 87.

²⁰⁸ National Film Preservation Act of 1988, Pub. L. No. 100-446, 102 Stat. 1774, 1782.

²⁰⁹ *Id.*

significant.”²¹⁰ It also ordered the Librarian of Congress to establish the National Film Preservation Board (NFPB), to be comprised of members selected from select industry organizations, academic institutes, and trade guilds, who were then tasked with selecting the films to be included in the National Film Registry.²¹¹

The 1988 Act was set to expire after three years,²¹² but was renewed in 1992.²¹³ As part of this renewal, the Librarian of Congress and the NFPB were required to “conduct a study on the current state of film preservation and restoration activities, including the activities of the Library of Congress and the other major film archives in the United States.”²¹⁴ Following that study, the Librarian of Congress was then required to “establish a comprehensive national film preservation program . . . in conjunction with other film archivists and copyright owners.”²¹⁵

The results of this study were catalogued in a series of reports released in 1993²¹⁶ and 1994.²¹⁷ The study ultimately concluded that films of all types were “deteriorating faster than archives [could] preserve them.”²¹⁸ Further, the system of funding at the time was an ineffective “patchwork of federal money, institutional outlays, foundation grants, and private donations,” with archives working with increasingly shrinking budgets.²¹⁹ In order to ensure the long-term preservation of film, the Board stressed the importance of private-public partnerships between studios, industry leaders, and public and nonprofit archives,²²⁰ firmly stating that “[s]olving America’s film preservation problems [was] beyond the resources of any single institution.”²²¹

To help facilitate this collaboration, the 1994 report included the first of many supporting documents outlining best practices for film preservation,²²²

²¹⁰ *Id.*

²¹¹ *Id.* at 1785–87 (identifying such organizations as the Academy of Motion Picture Arts and Sciences; the Department of Theatre, Film, and Television, College of Fine Arts at the University of California, Los Angeles; and the Directors Guild of America).

²¹² *Id.* at 1788.

²¹³ National Film Preservation Act of 1992, Pub. L. No. 102-307, 106 Stat. 264, 267.

²¹⁴ *Id.*

²¹⁵ *Id.*

²¹⁶ ANNETTE MELVIN & SCOTT SIMMON, LIBRARY OF CONG., FILM PRESERVATION 1993: A STUDY OF THE CURRENT STATE OF AMERICAN FILM PRESERVATION (June 1993).

²¹⁷ See generally NAT’L FILM PRES. BD., REDEFINING FILM PRESERVATION: A NATIONAL PLAN (Aug. 1994).

²¹⁸ *Id.* at 1.

²¹⁹ *Id.* at 21.

²²⁰ *Id.* at 21–25.

²²¹ *Id.* at xi.

²²² See *Keeping Cool and Dry: A New Emphasis in Film Preservation*, in NAT’L FILM PRES. BD., *supra* note 217, at 33 (outlining a “coherent and cost-effective” approach to film preservation).

establishing voluntary guidelines for studios and archives,²²³ and presenting a legal guide to help facilitate collaboration between studios and archives.²²⁴ In 1996, to further help facilitate the goals of the National Film Preservation Board, Congress created the National Film Preservation Foundation,²²⁵ a private “nonprofit charitable affiliate” of the NFPB charged to “encourage, accept, and administer private gifts to promote and ensure the preservation and public accessibility of the nation’s film heritage.”²²⁶

The NFPB has since been renewed multiple times and is currently authorized through fiscal year 2026.²²⁷ In addition to selecting films for inclusion in the National film registry,²²⁸ the board continues to promote collaboration between rightsholders and preservationists, and provides information and resources to help preservationists adapt to changes in technology and intellectual property laws.²²⁹ While not everything involving the NFPB can (or should) be adopted in creating a long-term preservation strategy for digital games, the example set by the Board and its successes presents a powerful foundation for digital game preservation to build upon.

B. *Establishing a Federally Funded Preservation Board*

When the NFPB released its national plan for film preservation in 1994, it acknowledged that “[s]olving America’s film preservation problems [was] beyond the resources of any single institution.”²³⁰ Any meaningful preservation effort required coordination between the film industry, multiple archives, and federally funded initiatives.²³¹ It is no different for digital games. Industry buy-

²²³ See *Handling and Projecting 35mm Archive and Studio Prints: Voluntary Guidelines*, in NAT’L FILM PRES. BD., *supra* note 217, at 39; *Joint Studio-Archive Restoration Projects: Voluntary Guidelines*, in NAT’L FILM PRES. BD., *supra* note 217, at 43.

²²⁴ See *Depositing Films with Archives: A Guide to the Legal Issues*, in NAT’L FILM PRES. BD., *supra* note 217, at 49–79.

²²⁵ National Film Preservation Foundation Act, Pub. L. No. 104-285, 110 Stat. 3382 (1996).

²²⁶ *Why the NFPF Was Created*, NAT’L FILM PRESERVATION FOUND., <https://www.film-preservation.org/about/why-the-nfpf-was-created> [<https://perma.cc/Q8EH-ND9Y>].

²²⁷ Library of Congress Sound Recording and Film Preservation Programs Reauthorization Act of 2016, Pub. L. No. 114-217, 130 Stat. 840.

²²⁸ See Ruben Kimmelman, ‘*Jurassic Park*, ‘*The Shining*, ‘and 23 Other Movies Added to National Film Registry’, NPR (Dec. 12, 2018), <https://www.npr.org/2018/12/12/675384976/jurassic-park-the-shining-and-23-other-movies-added-to-national-film-registry> [<https://perma.cc/S97J-KSRK>].

²²⁹ See, e.g., *National Film Preservation Board: Resources*, LIBR. CONGRESS, <https://www.loc.gov/programs/national-film-preservation-board/resources/> [<https://perma.cc/QE45-X27A>] (presenting a host of resources related to film and film preservation, such as recent legislation impacting film preservation, copyright issues related to film, preservation resources and projects, and past Board initiatives).

²³⁰ NAT’L FILM PRES. BD., *supra* note 217, at xi.

²³¹ See *supra* Part IV.A.

in is crucial both to obtain materials for preservation and to present a united front in convincing legislators and the public that digital game preservation is a worthwhile endeavor. At the moment, industry organizations often stand opposed to the most important steps towards long-term game preservation²³²—but that does not need to be the case.

A national board can establish a collaborative framework in which industry organizations such as the ESA can work *with* rather than *against* archivists to achieve a truly long-term preservation strategy. It can provide a common ground for people who genuinely care about the future of digital games to work together toward common goals that can serve to benefit both the public and the industry. Such a board should consist of representatives from archives and museums (such as the Library of Congress and the Internet Archive), academia (including scholars involved in both design and critical studies), major and minor publishers and developers,²³³ industry associations,²³⁴ legal experts, and other closely related groups.²³⁵ Among its priorities, the board must (1) develop a coherent plan to ensure the long-term preservation of source code, when that source code is still available, (2) establish methods to ensure that the games archived are the most “complete” versions available, (3) agree on a collective stance regarding the ability of libraries, archives, and museums to circumvent copyright protection measures in order to archive games for which the source code is no longer available, and (4) establish uniform model agreements and general best practices for digital game preservation, in order to ensure that preservation efforts are effective and uniform across archives.

1. *Establishing and Maintaining a Source Code Archive*

One of the most important priorities of the board should be the creation of a source code archive, likely through collaboration with the Library of Congress. In addition to the certainty promised by the Library of Congress’s general longevity, the use of a government agency may assuage the fears of many companies who might be worried about putting their source code in the hands of private organizations.²³⁶

²³² See, e.g., *supra* Part III.B.1 (covering the industry’s resistance to copyright exceptions for archives, libraries, and museums).

²³³ This is especially true of the “big three” hardware giants—Microsoft, Nintendo, and Sony.

²³⁴ Such as the ESA and the International Game Developers Association (IGDA).

²³⁵ Such as the Electronic Frontier Foundation (EFF). See ELECTRONIC FRONTIER FOUND., <https://www.eff.org/> [<https://perma.cc/ZPE4-AHWM>] (“The leading nonprofit defending digital privacy, free speech, and innovation.”).

²³⁶ See *supra* Part III.B.2 for a discussion how source code is protected under trade secret law and how the law requires the entity seeking trade secret protection to keep the source code “actually secret.”

The preservation of source code allows for the most complete preservation of digital games,²³⁷ but it also stands to provide economic benefits to the rightsholders. Whether this archive is entrusted to a single institution or delegated amongst several “approved” organizations (as is currently done with film),²³⁸ such an archive presents an opportunity for both archivists and rightsholders to lighten their own loads. Properly executed, it presents rightsholders with a convenient and secure way to maintain their intellectual property for future rereleases and can serve as an affordable, archival “back-up” of their projects.²³⁹ A source code archive has the added benefit of serving as a guaranteed source of evidence in the event of legal disputes involving source code and intellectual property infringement.²⁴⁰ In an era of constant retro rereleases and HD remakes,²⁴¹ rightsholders are primed to see the commercial benefit in offloading much of the work of preservation onto nonprofit and public archives who would be more than happy to maintain their source code.

A source code archive also provides a necessary safety net for digital-only games and can help ensure that the discontinuation of a specific digital platform does not mean that the game is lost forever.²⁴² With digital-only games, archives do not even have the option of preserving a physical copy. For a digital-only game tied to a specific platform, the only option is to download it to the system in question, leaving it inexorably tied to that piece of hardware and locked

²³⁷ See *supra* Part III.A.2 for an overview of the importance of source code for long-term digital game preservation.

²³⁸ See *Public Research Centers & Archives*, *supra* note 173 (listing “a comprehensive listing of Public Moving Image Archives and Research Centers from around the world”).

²³⁹ See Devin Monnens, *Why Are Video Games Worth Preserving?*, in *BEFORE IT’S TOO LATE*, *supra* note 18, at 148 (“Digital games are owned, as intellectual property, by the companies that design, produce, and distribute them. . . . [That] ownership [is] jeopardized if the assets in question are too easily lost.”).

²⁴⁰ See Zach Vowell, *What Constitutes History?*, in *BEFORE IT’S TOO LATE*, *supra* note 18, at 152 (arguing that archives not only help to preserve materials but have the added benefit of helping rightsholders “work through issues of intellectual property and other legal matters that may arise”).

²⁴¹ See, e.g., Gilbert, *supra* note 20 (covering the recent fad of miniature versions of classic game consoles pre-loaded with older games); Steven Strom, *The Diminishing Value of Gaming’s “HD Remakes,”* *ARS TECHNICA* (Apr. 13, 2015), <https://arstechnica.com/gaming/2015/04/the-diminishing-value-of-gamings-hd-remakes/> [<https://perma.cc/X7WF-Z3U9>] (arguing that while the trend of “HD remakes” of games serves an important function for game preservation, many of the remakes being released in 2015 were for games that had “been out for as little as 10 months” and functioned as quick cash grabs as home consoles moved from one hardware generation to the next).

²⁴² See *supra* note 142 and accompanying text for examples of contemporary digital-only games which are no longer available to the general public due to being removed from distribution platforms or due to entire distribution platforms being discontinued.

behind layers of DRM.²⁴³ Access to the source code and the ability to protect the code from degradation helps ensure that a digital-only game won't disappear forever once it is delisted or its digital storefront is closed down.²⁴⁴

Finally, any source code archive that is established must have an established procedure for updating the source code on file, rather than simply archiving the source code at launch. As mentioned above, physical copies of modern games are often incomplete upon release.²⁴⁵ Further, even those games that are complete and polished products upon release can often add layers of updates, expansions, and general bug fixes over time.²⁴⁶ The cooperation and collaboration of developers and publishers will be vital to maintaining such a system.

Due to the nature of trade secret laws, public access to source code archives is likely to be a contentious issue.²⁴⁷ To bring major industry associations to the table and ensure that rightsholders maintain the value protected by their trade secrets, it is likely that access to the source code archive would need to be limited to rightsholders and approved archivists, at least until the expiration of the copyrights protecting the games—with possible exceptions for approved researchers and historians. Even then, some companies might balk at the idea of their source code *ever* becoming publicly available. Because trade secret protection would otherwise outlive copyrights and other IP protections so long as the source code was kept secret, many companies may be extremely hesitant about giving up control. Ultimately, the Board would be responsible for brokering a deal with major rightsholders, drafting uniform agreements for the acceptance and protection of the source code and establishing agreed upon “release mechanisms” for when the source code may become publicly available.

Preventing public access to source code archives might frustrate many libraries, archives, and museums that would like to make such information available to the public sooner rather than later, but it at least ensures that (1) the source code is available so that the rightsholders may still use it for commercial

²⁴³ See Bode & Maiberg, *supra* note 151 (noting that, after a digital storefront is closed down, “if the games users bought . . . are not already downloaded, or if whatever storage device users put them on is destroyed, they’ll lose [the games] for good”).

²⁴⁴ See *supra* Part III.A.

²⁴⁵ See *supra* Part II.D.

²⁴⁶ Returning to *No Man’s Sky* as discussed in *supra* note 74, the developer has continued to release major updates and even complete overhauls of different systems, to the point where jumping from one major update to the next is “like landing on completely foreign terrain.” Gita Jackson, *No Man’s Sky’s Latest Update Makes Everything New*, KOTAKU (July 24, 2018), <https://kotaku.com/no-man-s-sky-s-latest-update-makes-everything-new-1827844781> [<https://perma.cc/M6T6-LV8W>]; see also Gita Jackson, *No Man’s Sky Is Getting a ‘New Multiplayer Experience,’* KOTAKU (Mar. 15, 2019), <https://kotaku.com/no-mans-sky-is-getting-a-new-multiplayer-experience-1833308940> [<https://perma.cc/7SMM-QJRC>].

²⁴⁷ See *supra* Part III.B.2 for a discussion of how source code is protected under trade secret law and how the law requires the entity seeking trade secret protection to keep the source code “actually secret.”

rereleases, securing some limited form of public access to the games themselves, and (2) the source code is not permanently lost to history. While finding a solution to the question of more open public access to the history of digital games is important to the development of the medium²⁴⁸ and should be a point of discussion among the Board, it is a question that ultimately falls outside the scope of this Note.

2. *Establishing a Collective Stance Regaining DMCA Exceptions*

The current system of establishing and maintaining exceptions to the DMCA to allow libraries, archives, and museums to circumvent copyright protection measures, while recently streamlined, still introduces an unnecessary and disruptive amount of uncertainty into the archival process.²⁴⁹ Further, the process is a forum that pits archivists and the industry against each other, rather than encouraging them to work together towards a shared goal of long-term preservation.²⁵⁰ Source code is simply not available for some games.²⁵¹ For those games, the code stored on the physical copies of the games is the only version available.²⁵² And, unfortunately, those physical copies will not last forever.²⁵³ Archives must have the ability to transfer the data from dying media to more stable media, and they need to be certain that their procedures are legal and will not be rendered illegal in three years' time.²⁵⁴ Rather than potentially fighting each other every three years, a national board allows archivists and industry representatives to come together, establish shared goals, and come up with a cohesive stance regarding DMCA exceptions that allows for long-term preservation.

²⁴⁸ See Emanuel Maiberg, *Nintendo's Offensive, Tragic, and Totally Legal Erasure of ROM Sites*, VICE: MOTHERBOARD (Aug. 10, 2018), https://motherboard.vice.com/en_us/article/bjbped/nintendos-offensive-tragic-and-totally-legal-erasure-of-rom-sites [https://perma.cc/8YLD-NAU6] (quoting game design professor Bennett Foddy: "As a professor, I very frequently see students spinning their tires trying to solve problems that were already solved in 1985. . . . And just as you would if you were teaching painting or music (or math), what you do as a teacher is you send them to the library to study the old classics, to see what they did right and wrong. That's the only way we can make progress in the sciences, the humanities, or in the creative arts. . . . If I was teaching poetry, I could send a student to read nearly any poem written since the invention of the printing press, but in games my legal options limit me to, I would guess, less than 1 percent of the important games from history . . .").

²⁴⁹ See *supra* Part III.B.1 for an overview of the DMCA exception process and the history of exceptions for digital games.

²⁵⁰ *Id.*

²⁵¹ See *supra* note 104 and accompanying text for examples of high-profile digital games where it is known that the source code has been lost.

²⁵² *Id.*

²⁵³ See *supra* Part III.A.1 for an overview of media degradation.

²⁵⁴ See *supra* Part III.B.1 (explaining that exceptions to DMCA must be renewed every three years).

The board must also address the issues presented by the shift towards digital distribution and the “games as service” model.²⁵⁵ The current exceptions allowing the circumvention of servers that have been taken offline—but only if the archive in question has access to the original server code—ignores the fact that archives rarely have access to that server code, and that companies themselves often discard the code after the servers go down.²⁵⁶ This, of course, must be addressed and best practices must be established to preserve server code, but it also brings up an issue for the future. As companies develop and implement new forms of DRM, a national board of preservation could offer a way for developers and publishers to work with archivists to ensure that such measures do not hinder preservation efforts, while helping to assuage any fears on the part of the companies that the people attempting to circumvent the DRM are merely attempting to violate the companies’ copyrights.

3. *Establishing Model Agreements and Best Practices*

Beyond merely resolving contentious legal issues standing between archivists and the industry, the establishment of a national board allows its members to get a lay of the land regarding the current state of game preservation, organize priorities as needed, and establish best practices.²⁵⁷ It also provides a platform to publicly promote the importance of game preservation and deepen the conversations around digital games in general. Through collaboration with industry leaders, a national preservation board should undertake a thorough survey akin to the one undertaken by the NFPB in 1993,²⁵⁸ allowing everyone involved to get a clearer picture of the broad state of game preservation, patterns of industry practices, and the areas of game preservation that need the most immediate attention. Once that information is in hand, the board can develop established best practices for both rightsholders and archives to ensure the long-term preservation of games, determine the ultimate scale of preservation that is possible given their resources, and facilitate cooperation between archives and rightsholders.

As part of these best practices, the board should draft model agreements that facilitate collaboration between archives and rightsholders, establish a set of expectations as to what various transactions should look like, and lower the legal costs of both sides. These model agreements should cover transactions such as the secure transfer of source code and possible update schedules for that source code as the game is changed and added to. The model agreements should also help facilitate other related transactions, such as if an archive wants to make a server available for a certain game or wants to make a game publicly available

²⁵⁵ See *supra* Parts II.D, III.B.3.

²⁵⁶ Birnbaum & Gault, *supra* note 146.

²⁵⁷ See generally MELVIN & SIMMON, *supra* note 216 (describing the state of preservation for the film industry); NAT’L FILM PRES. BD., *supra* note 217 (prescribing a national plan for film preservation).

²⁵⁸ MELVIN & SIMMON, *supra* note 216.

for play. Combined industry and archival knowledge also provide opportunities to co-develop special “archival emulators” that can more effectively run games whose source code has been lost.²⁵⁹

V. CONCLUSION

Looking at the world now, it is impossible to deny the effect that digital games have had on our culture. Games are now part of the “everyday world.” But it can sometimes be difficult to understand the value of preserving parts of that everyday world until they are lost. Unless we preserve those games that are part of our everyday, it will be impossible for future generations to understand the depth of their impact on our society, history, and culture.

The games of the past few decades chart the birth of a new and exciting medium of human creativity that combines purposeful design and interactivity, story and play. It is a form that will continue to grow and build on itself, providing entertainment to future generations and exploring new and exciting avenues of human experience. Beyond their historical value, digital games have value as individual works of art and expression that deserve to be preserved as much as any film, novel, or painting. They are an achievement of our culture and we should be proud to preserve them for the future.

A national preservation board presents industry organizations, government agencies, and archives with the opportunity to relieve many of the legal issues standing in the way of truly long-term preservation and ensures that future generations have access to this history. It also presents publishers and developers with financial incentives, allowing them to offload the costs of preserving the games for future use and rerelease, as well as providing rightsholders with a platform to promote their back catalogues. But most of all, it acknowledges the importance of digital games in our lives and culture.

Bringing a national game preservation board to life will require the support of the industry, of archivists, and of the general public. Legislators and policymakers will need to be convinced that digital games are worth preserving, and without the support of all three it will be a difficult case to make. Luckily, if the first two groups are able to work together, there is no question that they will be able to convince the third. People already love games—all archivists and industry leaders need to do is convince them that such a love is worth preserving.

²⁵⁹ See *supra* Part III.A.2 for a brief description of emulators and the difficulty involved in creating them.