Academic Research Papers
Culture: Policy, Management, and Entrepreneurship, 2024, 3(1): 53-70.
Paper Rreceived: 10 November 2023 Paper Accepted: 08 April 2024

Saving in Progress...: The Impact of Policy on Video Game Preservation

Leo Barton *

Abstract

Over the last four decades video games have not received sufficient preservation or archival resulting in many works being considered lost. This is still the case today, despite being a cultural practice the majority of Americans engage in to some degree (ESA 2021).

This paper analyzes the current state of video game preservation efforts in four parts. First, locating video games place in the cultural landscape of the digital era, identifying the factors which make video games a culturally significant force today. Second, identifying the broad, categorical obstacles which prevent adequate preservation. Third, analyzing specific national and international legislation which has shaped, and limited, preservation efforts. And, finally, uncovering the effects of such legislation on institution and fan-led preservation efforts.

Together, this paper highlights three broad challenges in preserving video games, past and present—public perception, object accessibility and legal accessibility. In turn inviting further inquiry and implementation to improve the policy surrounding video game preservation. These hurdles must be overcome before "historians lose objects that have made a significant cultural impact on the society of the late twentieth century and early twenty-first" (Hudgins 2011, 32).

Keywords

Digital cultural heritage, DMCA, games as culture, video games, computer games, literature review, archival, cultural policy

* Master's Student, School of Cultural Resources, Taipei National University of the Arts, Taiwan.

> *"Even if we could preserve all the silent era films known to exist today in the U.S. and in foreign film archives—something not yet accomplished—it is certain that we and future generations have already lost 75%"*
>
> James H. Billington (2013, vii-viii)
> Former Librarian of the US Congress

Many parallels can be drawn between the early years of cinema and gaming; both emerged from novel technologies, outputting a new form of mass media which, initially, seemed like little more than a plaything. Such shared humble beginnings have caused the early media of both formats to follow similar fates. James Billington, of the U.S. Library of Congress, supposes that 75% of early films might be lost, but the loss of early video games may be more disastrous (Billington 2013, vii-viii). In a recent study of 4000 games released before 2010, Phil Salvador found only 13% of games still available through publishers (Salvador, 2023). Putting that remaining 87% at risk of being effectively, or entirely, lost if left without adequate preservation. Digging deeper, abandoned ecosystems, such as the Commodore 64, had only 4.5% of games in a state of re-release. While such numbers may not be dissimilar to those of cinema, it is worth remembering that the genesis of commercial film came almost 80 years prior to the first commercial video game—before much of the archival infrastructure available by the late 20th century.

Studies like Salvador's re-sound the alarm which many media scholars have been ringing for decades, calling for increased awareness and funding of video game preservation. Yet, due to the intersection between games as cultural objects and commercial products, such preservation has continually proved difficult. This article aims to elucidate the core issues facing video game preservation—public perception, object accessibility and legal accessibility—alongside what current cultural policy exists to support and hinder the preservation of games. While I will frame these issues within the context of Europe and the United States, many of the issues analyzed are applicable beyond these borders.

It is also worth noting that this article will make a sharp distinction between culture and art. I, alongside many scholars and arts institutions, would strongly argue for games to be considered an artistic medium. Yet public opinion remains more ambivalent with some prominent thinkers, such as Brock Rough (2017) and Roger Ebert (2010), arguing against it. Yet, the discussion of preservation is a cultural matter. And while artistic value denotes an important category of cultural value, it remains only one of many. Thus, this discussion will side-step the spar of defining video games as art, instead identifying and outlining the broader cultural importance and influence of video games.

Structurally, this paper first positions games and video games as cultural objects, exploring how and why their prominent and multivalent cultural impact must be recognised. Second, identifies three key, contemporary hurdles to achieving adequate preservation. Third, analyses specific national and international legislation which has shaped, and limited, preservation efforts. And, finally, uncovers the effects of such legislation on institution and fan-led preservation efforts.

Together, this exploration aims to disseminate the broad challenges in preserving video games, past and present. These hurdles must be overcome before "historians lose objects that have made a significant cultural impact on the society of the late twentieth century and early twenty-first" (Hudgins 2011, 32).

Press Start: Games as Cultural Objects

Since the mid-20th century, cultural scholars and historians have been unearthing the importance of play as a cultural phenomenon (Huizinga 1938, 18). Roger Caillois (1962, 35) famously claimed that "the destinies of cultures can be read in their games"; their mechanics and framing encapsulating swathes of ideology. While such scholars began by considering physical games—be them enacted on a table or with our bodies—these ideas were given new, contemporary meaning with the inception of the video game.

To label games as cultural, we must identify some boundaries of culture. James Carey (1997, 272) provides a fundamental element, arguing that "culture, from the cultural studies view, is a process". This echoes E.P. Thompson's (1964) suggestion that culture is fundamentally rooted in ever-changing social and historical contexts. Drilling down further, Raymond Williams (1958, 47) identifies culture as "a whole way of life", alongside the common use of the term to refer to the forms of circulating signification (literature, art, etc.) found in the cultural sector. Clifford Geertz (1973, 5) conceptualised this as interconnected "webs of significance" which serve to generate and maintain meaning within and across groups. A concept which Stuart Hall (1998) makes tangible in providing two entry points to culture: ideas and social practices. Across these influential definitions, culture is identified as a moving target defined by its ever-evolving constituent parts and contexts. Articulated through ideas, social practice, and, resultantly, material objects. Games find themselves touching all the pillars of such a definition of culture.

With a rough boundary of culture defined, it will be beneficial to crystalize the concept of a game (both video- and otherwise). As scholarship surrounding games has grown, so too has the number of attempts at a definition. Bernard Suits (1978) identified that games task players to achieve something specific (prelusory goal) within a set of constitutive rules (lusory means) voluntarily accepted to make the activity possible (lusory attitude). A concept which has been refined and simplified by Katie Salen and Eric Zimmerman (2003, 80) who suggest "a game is a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome." While many further definitions have been offered by academics and designers, from Johann Huizinga, Roger Caillois, Ian Bogost and Jesper Juul to Chris Crawford, Greg Costikyan and more, it is worth noting that most, if not all, such definitions are broad and encompassing. These definitions sideline the trappings of narrative and visual aesthetics which are often used to justify the place of (video) games as artistic or cultural objects. That is to say, the cultural value of gaming isn't in its ability to emulate the narratives of literature, the aesthetics of visual art or the splendour of cinema. Instead, the cultural value of (video) games is distinct, while often simultaneously incorporating the affective capacities of other cultural formats.

In the wake of Marshall McLuhan's (1964, 7) aphorism "the medium is the message", cultural studies recognised the cultural power of format (medium) both alongside and independent of content (message). Mario Cerezo-Pizarro et al. (2023, 2) succinctly apply this to our current context arguing "to relate technology and culture in the 21st century is to understand how culture is constructed and disseminated and how these media have brought about a change that has profoundly influenced the irruption of new tools, resources and modes of communication." They go further to suggest "in a context in which the relationship between people and technology is becoming increasingly closer, the cultural implications of video games allow for consideration beyond the merely ludic, involving cultural, social and educational aspects" (Cerezo-Pizarro et al. 2023, 1). Providing a strong foundation for us to understand video games' core cultural importance as a new and distinct way of sharing ideas.

Loading...: The Cultural Values of Games

In December 1991, 45 million Nintendo game consoles were distributed across the United States, representing 34% of households in the country (Greenfield 1994, 4). By 2010, the global video game industry was worth around US$56 billion, "more than twice the size of the recorded-music industry" (Storz, Riboldazzi, and Moritz 2014, 125). While more recently, the Entertainment Software Association (ESA 2021) reported that in 2021 more than 70% of Americans played some kind of video game. While this continued expansion and increased multivalence of gaming culture has done most of the convincing for the ever-growing in-group of users, those who are not "gamers" often remain more sceptical of games' cultural value—even if they too play games[1]. Thus, scholars, game developers and players alike have continually attempted to label games as cultural objects in the public consciousness. Countless arguments have been put forward in this regard, and I will briefly touch upon some of the most fundamental.

Wide Consumption

Already illustrated by the statistics which opened this section, games are prevalent in today's media landscape. The implications of this are twofold. Firstly, as the majority of Americans—and a large portion of people across the planet—are actively engaging with video games the impact of both specific games and more generalised gaming cultures is very widespread. With many, from Mario and Grand Theft Auto to Minecraft and Fortnite, becoming part of the established cultural consciousness. Here, it is worth noting that although the demographic data is freely available from institutions such as the ESA, general awareness still suffers from video games having "historically been associated with adolescent males and an underground culture, as well as with frivolous and at times even asocial activities and lifestyles" (Molesworth and Watkins, 2014; Thornham, 2008). Many

1 Many of this out group may indulge in games that many would not class as "Real Games", such as Candy Crush, Farmville and other casual experiences, a distinction explored by Mia Consalvo, and Christopher A. Paul in *Real Games* (2018).

of which stereotypes have been obliterated by both empirical data which shows more age and gender diverse participation (Styhre et al. 2018; ESA 2023) and the rise of casual and mobile games which are largely played by "the folks derided by many in gamer culture as nonplayers, even as they are playing games for many hours and possibly spending large amounts of money doing so" (Consalvo and Paul 2019, xiv).

In short, as Kurt Squire (2002, 3) neatly puts it, "games are integral parts of our lives, yet they've largely gone unexamined."

Diverse Applications

Perhaps due to the verb *play* holding subtle pejorative undertones, the broad applications of gaming technologies and culture are often overlooked. Most are likely familiar with gaming's entertainment value and social applications—the latter achieved through both multiplayer experiences and dedicated social platforms which span from today's Fortnite, VR Chat and Highrise to foundational experiences like World of Warcraft and Second Life. Yet Gaming technologies are also applied to a whole other realm known as the serious game or applied game (Abt 1987).

One of the most common styles of serious games are training simulations, widely found in the medical, aeronautical, military, and other fields where the dangers of training can be reduced via simulation. Beyond training, other scientific, political, and business simulations have been categorised as serious games in their ability to test hypothetical situations, monitoring either the reaction of the system or the users themselves. It is also worth noting that numerous gaming technologies—such as those found within virtual reality systems and computing in general—have received significant research and development within these other sectors before trickling down to consumer entertainment. Education is another sector filled with serious games. Both youth and adult education tools and structures are commonly formatted as games (Squire 2002). While there is a controversial emerging trend of assessment games being used in both schools and the workplace (Thomas Smith 2023).

Beyond training, simulation and education, physical therapy and psychiatry have found fruitful applications for serious games in treatment programs. Meaning that today "we have a game-based intervention for most of the disorders identified in Psychiatry" (Vajawat et al. 2021).

While I cannot aim to articulate the full range of applications for video games, this broad survey of use cases brings into view the wider cultural effect and value of games beyond just art and entertainment.

Growing Up in Games

Returning to games as an object of play, it is worth noting the inadvertent effects that games have had on generations of young people since the 1980s. Such a discussion falls into the realms of individual development and generational identity; the first having received more attention than the difficult to quantify latter.

Research on video games' impact on human development reaches back into the 1980s,

when Ronald Reagan (1983) famously exclaimed how video games were increasing hand-eye coordination and subconsciously training the next generation of military pilots. Since then, a number of empirical studies have been confirming that video games do indeed "develop skills in the dynamic representation of space" (Greenfield 1994, 4). With meta analyses locating a clear "cognitive worth of playing games" (Henderson 2005, 13). In line with this, the ESA found that 96% of gamers perceived games as being beneficial to them in some way (ESA 2023). Anecdotally, I believe I learnt many of my navigational skills from video games, alongside being exposed to a variety of real-world concepts and terminologies which I would not have otherwise encountered—in line with the general findings that "playing a recreation video game provide[s] beneficial informal educative experiences"(Henderson 2005, 13).

Beyond developing skills, such studies have labelled "video games as a cultural or cognitive artifact [which] have tremendous social importance because of their nature as a mass medium" (Greenfield 1994, 4). These generation-defining experiences go beyond social and shared entertainment towards foundational ways that young people engage with the computer technologies which they will continue to use for the rest of their lives.

Gaming Culture, Work and Social Issues

Outside of the act of play, gaming culture pervades the lives of many. Overlapping social groups are formed through games—from in-person communities to online groups to the hordes of individuals who attend the countless gaming conventions across the globe. Not only do communities form around the playing and discussion of games, but more still are employed within the production of games. 2022 estimates suggest that around 250,000 people in the United States alone earn their living within the gaming industry (IBIS World 2023).

It is, of course, not all roses though. The gaming industry is also home to many important social issues from addiction (Perrotta et al. 2019) to toxicity and bullying (Consalvo and Paul 2019, 128) to exploitative business practices like underpaid, uncredited outsourcing and unreasonable deadlines resulting in crushing unpaid overtime known as "crunch".

These aspects of the gaming industry impact gamers and industry employees in significant ways; leaving its cultural residue within and around the cultural products that are video games.

Towards Preservation

These factors have been covered at pace, due to the fact multiple papers could and have been written on each granularity, yet, together, they have identified the broad cultural implications that video games have today. Through these factors, and more, scholars like Daneil Muriel and Garry Crawford (2018, 3) have asserted several assumptions: "1. Video games are an undoubtedly contemporary reality; 2. Video games embody some of the most important aspects of contemporary society; 3. Video games are established cultural products; 4. There is a growing and consolidating video game culture". Arguing that if

digimodernism[2] "is the hegemonic cultural logic of contemporary society and both the video game and the video gamer are its principal object and subject, then studying video game culture provides us with the key tools with which to understand our contemporary cultural landscape" (Muriel and Crawford 2018, 4). It is from this vantage point that the cultural value and significance of games becomes clear.

In understanding the wealth of cultural influence, information and history tied up within the medium, preservation offers the opportunity to remember, study and learn from the cultural shifts of the last four decades. In interview digital historian Henry Lowood (Risen 2010) stated that "in the future, if people want to understand our culture, they're going to need documents and information" to make sense of this tangle of digital media. Indeed, the digital realm may be the next generation of archaeological site. And games will make up an important part of the dig.

Error, Please Try Again: Obstacles to Preservation

The Museum of Modern Art (MoMA) in New York City sent shockwaves through the art world in late 2012 by accepting video games into its permanent collection. While it was not even close to the first institution to house or exhibit video games its high profile along with the large amount of backlash and buzz made this an important moment for opening institutional doors to video games and their preservation (Bourgonjon et al. 2017). Since then, games exhibitions have become more commonplace in high profile institutions such as London's Victoria and Albert Museum, Washington D.C.'s Smithsonian American Art Museum and more—given, such exhibitions are still relatively rare. While these exhibitions are not always linked to successful preservation efforts, they effectively validate the status of digital games in contemporary culture through the museum's position as cultural gatekeepers (Eklund et al. 2017, 2).

Yet beyond temporary exhibitions and small collections—note that MoMA only hold 36 games in their collection as of 2022—games preservation is a herculean task. Not only are there a gargantuan number of games already released[3] but they are done so across a variety of devices and operating systems each with specific requirements to be able to run correctly. With a large portion of old games receiving no updates for modern hardware, preservation not only means preserving the file, disk or cartridge but also preserving the means of making it run.

Beside preserving game experiences, themselves, scholars throughout the 2010s begged the question what about gaming culture? (Sköld 2015; Swalwell 2013) Such suggestions highlight that preserving video games should also encompass non-material aspects and contexts, pushing efforts to span everything from software, hardware, code and commercial paraphernalia to community events, business practices and creative documentation (Bachell and Barr 2014, 140). It has also been highlighted that "the dark

2 Digimodernism being a paradigm shift articulated by Alan Kirby (2009) where information and culture have greatly shifted to largely involve active users as both participants and creators of content, opposing traditional institutions as the primary sites of cultural manufacturing.

3 Steam, the largest PC marketplace, alone hosts 162,237 games as of December 2022.

heritage of games should be discussed as inseparable parts of game heritage", crystalizing the memory of the unglamorous issues which gaming also brings to contemporary culture (Nylund et al. 2020, 3). Such preservation should also include a diverse array of game types—commercial and serious (Djaouti et al. 2011)—somewhat independent of their acclaim or perceived impact today. Altogether aligning with the holistic preservation suggested by Christian Dupont's framing of libraries, archives, and museums as institutions which "make a better future by helping us remember and understand the past" (Dupont 2007, 13).

The process of preserving any media is permitted largely by three factors: public perception, object accessibility and legal accessibility. When it comes to gaming, these take markedly 21st century forms.

Perception

Before preservation efforts can be embarked upon, a category of objects must be designated as worth preserving. Within the context of archaeology, science and even politics such designation may seem relatively straightforward—but when it comes to culture, misjudgement and belated importance often misguide public perceptions. As already discussed, there remains a widespread apathy towards video games' cultural importance, specifically from non-gamers. This is precisely why the former section's discussion still warrants repeating in the 2020s.

This is not to berate the public, though. James Newman (2009) has suggested that this disinterest is "symptomatic of an industry that, despite its public proclamations, neither places a high value on its products as popular culture nor truly recognizes their impact on that culture." An issue further compounded by commercial pressure which encourages both developers and gamers to "value the newest games and denigrate the older ones" (Hudgins 2011, 39). Not to mention that there is a significant "experiential gap between people who have immersed themselves in games, and people who have only heard secondhand reports" (Johnson 2005, 25). Because of this, alongside games' place as objects of play, it has taken time for the medium to mature to a place of significant artistic achievement before achieving anything close to a generalised cultural recognition.

The urgency of video game preservation is hindered by this poor public perception. As Allison Hudgins has noted, games "suffer from the attitude that they are too new to be in need of immediate preservation"; in other words, you are more likely to hear about the need to preserve and restore a hundred-year-old silent film, or thousand-year-old painting, than a thirty-year-old game (Hudgins 2011, 38). If we wait until these games are old, out of print and partially lost before engaging in preservation, we risk darkening the prognosis of a complete and coherent history of games and their cultural impacts.

Object Accessibility

For anything to be adequately preserved, it must first be accessed in some way. No object or information means no preservation. For games, as already mentioned, the objects of interest include playable games, working hardware and records of peripheral elements

(advertising, community, reception, footage, work practices etc.). While the latter faces familiar preservation challenges, attempts to preserve videogame hardware and software face notable issues of obsolescence and bit rot.

All video games are created for specific computer systems. As computation continues to develop, operating systems and hardware are quickly, and inevitably, superseded or abandoned with software often being left in the wake, unless updated by developers. This outdated, and no longer supported hardware, is classed as obsolete. Translating to today's difficulty accessing games made for, for example, the Atari 2600, Windows 98, or even the far more recent Wii U. Each of which require direct access to the obsolete systems: either original functioning hardware or through computer emulation. However the latter is less than ideal for adequate preservation due to its, often, legal ambiguities.

Software storage solutions, like floppy discs, game cartridges or laserdisc, all face the risk of bit rot (or bit loss). This is the physical deterioration of the data stored within them. Over time, this can result in unplayable software, which can only occasionally be wholly recovered through restoration. The lifespan of floppy disks has been approximated at 10 to 30 years (Gilbert 1998). For many games of the 1980s and 1990s which were distributed on floppy, that life expectancy has already passed.

Legal Accessibility

Even with positive perception and object availability, video game preservation runs into one of its greatest challenges: gaining legal access. The issue here pertains primarily to copyright law, which effects everything from restoration and creating preservation copies to emulating old software or systems.

Of course, copyright law protects gaming companies from piracy, but its stringency has the unintended consequence of simultaneously hindering preservation efforts. Complicating matters further, many gaming companies want to retain exclusive access to their past games for present and future commercial purposes; rereleases, remakes, and remasters.

In practice, copyright law, such as *section 106 of the Copyright Act*, prevents archives from creating and emulating software or even running it on original hardware if any aspect of the software has been copied; thwarting many restoration and research efforts necessary to facilitate preservation (Aufderheide et al. 2018, 4).

While copyright is a hurdle for much contemporary archival, games have the additional disadvantage of their hazy categorization between entertainment product, software, and cultural object. This has resulted in the non-uniform legal definition of video games across borders. One example being varying copyright regulations for games, and their constituent code, graphics, story, music, and other elements. Some nations, like Canada, China, Israel, Italy, and Spain, consider these elements as one joint work of authorship under copyright, while others, like Brazil, Japan, France, Germany, and the USA, protect each constituent component as distinct works of authorship (Harkai 2022, 847).

Joanna Barwick (2019, 24) puts it well, explaining that "a technological preservation

approach of collecting hardware, software and the paraphernalia surrounding games cannot be relied on as a permanent solution to providing access to these materials... [yet] it is essentially the only effective method of preservation which does not break the law". Resulting in many archives resembling "a database, and not an archive... because of legal ramifications" (Noah Smith, 2022).

Together, these factors of public perception, object accessibility and legal accessibility outline the complexity of contemporary games preservation—all of which require effort and support to overcome. Forward-thinking cultural policy, both legal and otherwise, can provide this support.

File is Protected: Existing Policy Surrounding Games Preservation

The turn of the century saw a wave of digital policymaking which continues to form the boundaries of digital copyright and preservation today. Eminent examples of this are *the USA's 1998 Digital Millennium Copyright Act*, and UNESCO's *2003 Charter on the Preservation of Digital Heritage*.

As its name suggests, the *Digital Millennium Copyright Act* (DMCA) centres on creating concrete copyright law for digital products; criminalizing software and practices that have the intent of circumventing DRM. Digital Rights Management (DRM) being a measure that developers use to prevent unwarranted copying or redistribution of software. While the original DMCA heaped the same restrictions onto consumers, archives and libraries, later triennial revisions have acknowledged the need for archival.

The DMCA's 2003 rulemaking eased copyright on obsolete games and gaming hardware, opening it up for preservation (United States Copyright Office 2003). While 2018 revisions permitted libraries, archives, and museums to make copies of non-online games that are "no longer reasonably available in the commercial marketplace", or online titles whose servers have been permanently shut down—provided the initial copies were lawfully acquired (United States Copyright Office, 2018). In theory, this legislation opens up Salvador's 87% of endangered games for preservation—at least within the United States (Salvador 2023). Yet in practice, lawfully acquiring out-of-print games or access to shut down online only experiences—especially if they have been considered obsolete for decades—is far easier said than done. Interestingly, 2021 revisions to the DMCA further extended these privileges to all types of software.

While not legally binding for member states, UNESCO's *2003 Charter on Digital Heritage* advocated preserving "unique resources of human knowledge and expression... [where] there is no other format but the digital object". While, interestingly, the charter fails to name video games directly, their importance is heavily implied between the "texts... still and moving images, audio, graphics [and] software" which is explicitly mentioned (UNESCO 2003, 1). Perhaps the most noteworthy article in the charter is the exclamation that such digital heritage should be made freely accessible to the public while striking a "fair balance between the legitimate rights of creators and other rightsholders and the interests of the public to access digital heritage materials" (UNESCO

2003, 2).

While these examples of policymaking purport preservation advocacy, in practice they provide archives with little power beyond the archival of abandonware—a process which can only begin when archival objects are already endangered, degraded, or lost. Furthermore, under the DMCA, archives may be permitted to make some legal copies, but for those copies to be legal they must remain complete, thus requiring the archive to copy any included DRM which can lead said copies to be legally inaccessible (Hudgins 2011, 37). Such technological protection measures have also been extended to hardware that provides access to games, elucidated by a case brought to the Court of Justice of the European Union by Nintendo (Harkai 2022, 847). Together, rendering the apparent broad scope of the above policymaking to be far narrower than it first appears.

More recently, the European Union passed the *Directive on Copyright in the Digital Single Market* (CDSM) in 2019. For archives, this largely compiled prior legislation which followed almost exactly in the footsteps of the previously discussed DMCA and UNESCO charter. Yet, Istvan Harkai has highlighted that the CDSM leaves huge grey areas when put into conversation with other existing EU legislation. For example, even preserving abandonware can be seen as legally problematic, with limitations arising at the intersection between the CDSM, *Orphan Work Directive* and *InfoSoc Directive* (Harkai 2022, 852). For Harkai (2022, 853), this issue stems from the fact that "the CDSM does not specify what should be considered as conservation". Meaning that while such legislation may "provide an appropriate environment for the preservation of game software at the institutional level", legal grey areas, especially when it comes to the archival of contemporary works, may quickly plunge young or underfunded archival efforts into a legal quagmire (Harkai 2022, 854). Causing many preservation efforts to rely on independent funding, developer donations and, in many fan-led cases, simply breaking the law.

Read-Only: Institutions

The number of video game museums and archives has steadily increased since the early 2000s, alongside video games' inclusion in the collections and exhibitions of established arts institutions—from the New York MoMA to London's Victoria & Albert Museum. Yet, the total number of physical institutions dedicated to video game preservation remains firmly under 50, worldwide. While this number is supplemented by a plethora of online and fan-led groups, such groups do not satisfy the "continuous processes" necessary to reliably safeguard video game history from loss (Barwick et al. 2019, 2-3).

To better understand the general funding and functioning of these dedicated institutions, let us briefly explore a cross section of three—Germany's Computerspielemuseum, the UK's National Video Game Museum, and the Finnish Museum of Games.

Founded in 1997, Berlin's Computerspielemuseum originated as a single, permanent exhibition of digital interactive entertainment culture, with the mission to spur positive perception of games and other digital interactive works. Despite initially closing its doors in 2000, the museum reopened in 2011 and has run continuously since. Receiving notable

support by the German Federal Ministry of Education and Research alongside various German cultural funds, the Computerspielemuseum is also a key supporter of EFGAMP—the European Federation of Video Game Archives. The governmental interest and support afforded to the Computerspielemuseum positions it as somewhat of an outlier, though.

Self-proclaimed as the world's first cultural centre dedicated entirely to video games, the UK's National Videogame Museum has spent most of its lifespan without government support or funding. Instead, their operation costs are covered by admission prices, sponsors, and other independent activities (National Videogame Museum). During the COVID-19 pandemic, the National Videogame Museum did receive a grant from the Arts Council of England's Culture Recovery Fund—but similar grants were provided to most arts institutions across the country.

The Finnish Museum of Games' origin is the most markedly 21st century—crowdfunding. In 2015, the founders created a crowdfunding campaign which raised €85,860 from 1,120 backers including hefty support from some of Finland's most well-known game development studios; Supercell, Housemarque and Colossal Order among others. While the museum has been supported by the City of Tampere, alongside its university and other local institutions, the lack of impartial and adequate funding sets the institution, like many of its international counterparts, on uneven ground.

Approaching this directly in interview, Jon-Paul Dyson, of The Strong National Museum's International Center for the History of Electronic Games, has stated that due to the lack governmental initiatives, video game museums and archives are dependent on donations—both to stay afloat financially and to build their collections (Barwick et al. 2019, 21). This is despite global governments' continually growing interest in digital preservation practices of other media—from digitising books to creating 3D scans of historical objects. In the eyes of Andreas Lange, founder of the Computerspielemuseum, "games are excluded from that and there is no one in government questioning this exclusion" (Barwick et al. 2019, 22).

Jailbreak: Independent Preservation

Widespread governmental disinterest, and its resultant lack of funding, have left many core preservation efforts in the hands of fans. Such fan-led efforts often appear as repository websites where anonymous users upload cracked versions of software alongside the hardware emulators required to access them. Such efforts clearly align with the goals of the UNESCO *Charter of Digital Heritage*, as they provide public access to games and hardware that is, mostly, no longer commercially available.

Such independent archives, both in this online format and in the physical form of private individual or group collections, have come to form or assist various institutions worldwide. Examples being Ontario's Personal Computer Museum, wholly formed from one individual's collection, or the Pelikonepeijoonit collective's sizable contributions to the Finnish Museum of Games.

That said, the issues with private and fan-led collections are manifold, marking them

as unreliable long-term solutions. For example, collections held by individuals or small groups are subject to the whims, preferences, and abilities of the few, with the potential for loss happening both due to a lack of interest in certain objects or a lack of adequate preservation practices. Furthermore, when these efforts move into online repositories, these issues compound. Not only do archives rely on the continued functioning and maintenance of (often) unstable and outdated websites but many of these websites sit on the fringes of legality. Without the protection of institutional standards, many of these repository sites resemble little but the piracy of older titles. In turn, leaving their creators and preservation efforts vulnerable to legal ramifications, seizure and takedown. Many such site operators protect themselves by claiming that "downloading such games is legal, as long as the user owns a material copy of it", something which is difficult to disprove (Barbier 2014, 5). Yet relying on legal loopholes forms a flimsy shield around these valuable fan-led archives.

Beyond the legal status of such sites, amateur preservation often fails to preserve anything beyond the playable game itself. Removing the necessary context, information, and physical paraphernalia necessary to locate these games as valuable parts of cultural history. Thus, while developer Dan Pinchbeck suggests amateur preservation may make up "at least 50% of game preservation", it is not a sufficient substitute for longstanding, reliable and legal institutional efforts (Barwick 2019, 7).

Saving in Progress...

As the "cultural record is increasingly made up of complex digital objects" the impact of video games on contemporary culture is clear; whether that be through cultures of play, generational exposure, the increasing industrial use of serious games or a plethora of other factors (Meyerson 2017). However, contemporary preservation of these cultural artefacts is made difficult through both a lack of consistent governmental support and (ambiguous) legal barriers. Leaving many impactful works, and their contexts, at risk of being lost—provided they are not already.

While this article has discussed the challenges of public perception, object accessibility and legal accessibility, the review of legislation, institutions and fan-led efforts suggest that the factors of public perception and legal accessibility are the most pressing. As improving these factors could provide archival efforts with the support and resources they need to be more effective at acquiring, archiving, and restoring these cultural objects while they are still available. Such improvements could stem from a variety of places. Such as: defining clearer regulations and legal concessions for archives, particularly regarding the creation of preservation copies and the archival of circulating works, to ensure that games can be adequately catalogued before becoming in danger of loss or degradation. Increasing governmental and institutional support to signal and initiate further co-operation from for-profit developers to contribute to preservation efforts. Or increasing public awareness to snowball archival efforts, increasing funding and personnel while further expanding study of the medium and its cultural impact.

Ultimately, as Joanna Barwick states, "the preservation of computer games at present

is based on imperfect solutions...beset by legal ramifications" (Barwick 2019, 24). Cultural policymakers have a powerful role to play in steering the ship of preservation back on course, in order to preserve the digital heritage of the late 20th and early 21st century for centuries to come.

References

Abt, Clark C. 1987. *Serious Game*s. Lanham, MD: University Press of America.

Aufderheide, Patricia, Brandon Butler, Krista Cox, and Peter Jaszi. 2018. Temple Claggett. *The Copyright Permissions Culture in Software Preservation and its Implications for the Cultural Record*. Washington, DC: Association of Research Libraries. Website: https://www.arl.org/resources/the-copyright-permissions-culture-in-software-preservation-and-its-implications-for-the-cultural-record/.

Bachell, Alexandra, and Mathew Barr. 2014. "Video Game Preservation in the UK: A Survey of Records Management Practices." *International Journal of Digital Curation,* 9(2): 139–70. https://doi.org/10.2218/ijdc.v9i2.294.

Barbier, Benjamin. 2014. "Video Games and Heritage: Amateur Preservation?" *Hybrid*, 1. https://doi.org/10.4000/hybrid.1107.

Barwick, Joanna, James A. Dearnley, and Adrienne Muir. 2019. "Playing Games with Cultural Heritage: A Comparative Case Study Analysis of the Current Status of Digital Game Preservation." *Games and Culture, 6 (4), pp. 373–390.* https://doi.org/10.1177/1555412010391092.

Billington, James H. 2013. "Foreword." In *The Survival of American Silent Feature Films: 1912–1929*, edited by David Pierce, vii-viii. Washington, DC: CLIR Publications.

Bourgonjon, Jeroen, Geert Vandermeersche, Kris Rutten, and Niels Quinten. 2017. "Perspectives on Video Games as Art." *CLCWeb: Comparative Literature and Culture*, 19(4). https://doi.org/10.7771/1481-4374.3024.

Caillois, Roger. 1962. *Man, Play, and Games*. Translated by Meyer Barash. London: Thames and Hudson.

Carey, James. 1997. "Political Correctness and Cultural Studies." In *A Critical Reader* edited by Eve Stryker Munson and Catherine A. Warren, 17-40. Minneapolis: University of Minnesota Press.

Cerezo-Pizarro, Mario, Francisco-Ignacio Revuelta-Domínguez, Jorge Guerra-Antequera, and Jairo Melo-Sánchez. 2023. "The Cultural Impact of Video Games: A Systematic Review of the Literature." *Educational Sciences*, 13(11), 1116. https://doi.org/10.3390/educsci13111116.

Consalvo, Mia, and Christopher A. Paul. 2019. *Real Games: What's Legitimate and What's Not in Contemporary Videogames*. Cambridge, MA: The MIT Press.

Djaouti, Damien, Julian Alvarez, Jean-Pierre Jessel, and Olivier Rampnoux. 2011. "Classifying Serious Games: The G/P/S Model." In *Handbook of Research on Improving Learning and Motivation through Educational Games: Multidisciplinary Approaches* edited by Patrick Felicia. Hershey, PA: IGI Global. 118-136. https://doi.org/10.4018/978-1-60960-495-0.ch006.

Dupont, Christian. 2007. "Libraries, Archives, and Museums in the Twenty-First Century: Intersecting Missions, Converging Futures?" *RBM: A Journal of Rare Books, Manuscripts, and Cultural Heritage*, 8(1): 13–19. https://doi.org/10.5860/rbm.8.1.271.

Ebert, Roger. (2010). Video Games Can Never Be Art. Ebert Digital LLC, April 16. Website: https://www.rogerebert.com/roger-ebert/video-games-can-never-be-art

Eklund, Lina, Björn Sjöblom, and Patrick Prax. 2019. "Lost in Translation: Video Games Becoming Cultural Heritage?" *Cultural Sociology*, 13(4):444-460. https://doi.org/10.1177/1749975519852501.

Entertainment Software Association. 2021. ESA Video Games in the 21st Century: The 2021 Impact on the United States. Washington, DC: Entertainment Software Association.

Entertainment Software Association. 2023. *Essential Facts Above the U.S. Video Game Industry*. Washington, DC: Entertainment Software Association.

European Parliament. 2019. Directive on Copyright in the Digital Single Market.

Geertz, Clifford. 1973. The Interpretation of Cultures. New York: Basic Books.

Gilbert, Michael W. 1998. "Digital Media Life Expectancy and Care." *@OIT*, Issue 98, Fall. http://www.caps-project.org/cache/DigitalMediaLifeExpectancyAndCare.html.

Greenfield, Patricia M. 1994. "Video Games as Cultural Artifacts." *Journal of Applied Developmental Psychology*, 15(3): 3–12.

Greenfield, Patricia M., Carol Brannon, and Denise Lohr. 1994. "Two-Dimensional Representation of Movement Through Three-Dimensional Space: The Role of Video Game Expertise." *Journal of Applied Developmental Psychology,* 15: 87-103.

Hall, Stuart. 1992. "Cultural Studies: Two Paradigms." In *Cultural Studies* edited by Lawrence Grossberg, Cary Nelson, and Paula Treichler, 277-293. New York: Routledge.

Harkai, Istvan. 2022. "Preservation of Video Games and Their Role as Cultural Heritage." *Journal of Intellectual Property Law & Practice* 17(10): 844–856. https://doi.org/10.1093/jiplp/jpac090.

Henderson, Lyn. 2005. "Video Games: A Significant Cognitive Artifact of Contemporary Youth Culture." In *Proceedings of DiGRA 2005 Conference: Changing Views – Worlds in Play*. Vancouver, BC: Digital Games Research Association.

Hudgins, Allison M. 2011. "Preservation of the Video Game." *Provenance, Journal of the Society of Georgia Archivists,* 29(1): 31-48 .

Huizinga, Johan. 1938. *Homo Ludens*. Haarlem: Tjeenk Willink.

IBISWorld. 2023. "Video Games in the US - Employment Statistics 2004-2029." Accessed December 2023. https://www.ibisworld.com/industry-statistics/employment/video-games-united-states/.

Johnson, Steven. 2005. *Everything Bad Is Good for You: How Today's Popular Culture Is Actually Making Us Smarter*. New York: Riverhead Books.

Kirby, Alan. 2009. Digimodernism. New York: Continuum.

Mardon, Rebecca, and Mike Watkins. 2012. "Attachment to Digital Virtual Possessions in Videogames." In *Research in Consumer Behavior* edited by Russell W. Belk, 12: 19-32. Bingley: Emerald Group Publishing Limited,. https://doi.org/10.1108/S0885-2111(2012)0000014012.

McLuhan, Marshall. 1964. *Understanding Media: The Extensions of Man*. New York: McGraw-Hill.

Meyerson, Jessica. 2017. "Software Preservation Network: The Access Breakdown and System Level Change." Presented at the ADE Summit, Library of Congress, Washington, DC, November 16, 2017. http://digitalpreservation.gov/meetings/ade/slides/session4_

speaker2_Meyerson.pdf.

Molesworth, Mike, and Rebecca D. Watkins. 2014. "Adult Videogame Consumption as Individualised, Episodic Progress." *Journal of Consumer Culture*, 16(2). https://journals.sagepub.com/doi/10.1177/1469540514528195.

Muriel, Daniel, and Garry Crawford. 2018. *Video Games as Culture: Considering the Role and Importance of Video Games in Contemporary Society*. London and New York: Routledge.

National Videogame Museum. 2023. *About Us*. Sheffield, UK: National Videogame Museum. Website: https://thenvm.org/about/ (Accessed August 2023).

Newman, James. 2009. "Save the Videogame! The National Videogame Archive: Preservation, Supersession and Obsolescence." *M/C Journal,* 12(3). https://doi.org/10.5204/mcj.167.

Nylund, Nils, Patrick Prax, and Olli Sotamaa. "Rethinking Game Heritage – Towards Reflexivity in Game Preservation." *International Journal of Heritage Studies,* 27(3): 268-80. https://doi.org/10.1080/13527258.2020.1752772.

Okagaki, Lynn, and Patricia A. Frensch. 1994. "Effects of Video Game Playing on Measures of Spatial Performance: Gender Effects in Late Adolescence." *Journal of Applied Developmental Psychology,* 15(1): 33-58.

Perrotta, Carlo, Chris Bailey, Jim Ryder, Mata Haggis-Burridge, and Donatella Persico. 2019. "Games as (not) Culture: A Critical Policy Analysis of the Economic Agenda of Horizon 2020." *Games and Culture*,15(8): 902-922. https://doi.org/10.1177/1555412019853899.

Reagan, Ronald. 1983. "Remarks During a Visit to Walt Disney World's EPCOT Center Near Orlando, Florida." March 8, 1983. Website: https://www.reaganlibrary.gov/archives/speech/remarks-during-visit-walt-disney-worlds-epcot-center-near-orlando-florida.

Risen, Clay. 2010. "Pac Rat." *The Atlantic*, March 2010. Interview with Henry Lowood. Website: http://www.theatlantic.com/magazine/archive/2010/03/pac-rat/7911/(Accessed April 5, 2021).

Rough, Brock. 2018. "The Incompatibility of Games and Artworks." *Journal of the Philosophy of Games*, 1(1). http://dx.doi.org/10.5617/jpg.2736.

Salen, Katie, and Eric Zimmerman. 2003. *Rules of Play: Game Design Fundamentals*. Cambridge, MA: MIT Press.

Salvador, Phillip. 2023. *Survey of the Video Game Reissue Market in the United States*. US: Video Game History Foundation and the Software Preservation Network. https://doi.org/10.5281/zenodo.8161056.

Shaw, Adrienne. 2010. "What Is Video Game Culture? Cultural Studies and Game Studies." *Games and Culture*, 5(4): 403-424. https://doi.org/10.1177/1555412009360414.

Smith, Noah. 2022. *Academics Want to Preserve Video Games. Copyright Laws Make It Complicated*. The Washington Post, January 12, 2022. Interview with Adrienne Shaw. https://www.washingtonpost.com/video-games/2022/01/12/video-game-preservation-emulation/.

Smith, Thomas. 2023. *Assessment Games*. Talk presented at the Game Developers Conference (GDC) Vault. https://www.gdcvault.com/play/1039983/Assessment-Games (Accessed December 2023).

Storz, Cornelia, Federico Ribolazzi, and Moritz John. 2015. "Mobility and Innovation: A Cross-Country Comparison in the Video Games Industry." *Research Policy*, 44(1): 121-137. https://doi.org/10.1016/j.respol.2014.07.015.

Squire, Kurt. 2002. "Cultural Framing of Computer/Video Games." *Game Studies*, 2(1). http://www.gamestudies.org/0102/squire/.

Styhre, Alexander, Anna Maria Szczepanska, and Björn Remneland-Wikhamn. 2018. "Consecrating Video Games as Cultural Artifacts: Intellectual Legitimation as a Source of Industry Renewal." *Scandinavian Journal of Management,* 34(1): 22-28. https://doi.org/10.1016/j.scaman.2017.11.003.

Subrahmanyam, K., and Patrica M. Greenfield. 1994. "Effect of video game practice on spatial skills in girls and boys." *Journal of Applied Developmental Psychology*, 15: 13-32.

Suits, Bernard. 1978. *The Grasshopper: Games, Life and Utopia*. 3rd ed. Peterborough, ON: Broadview Press.

Swalwell, Melanie. 2013. "Moving on from the Original Experience: Games History, Preservation and Presentation." Presented at DiGRA 2013: DeFragging Game Studies, Atlanta, GA, August 26-29.

Thompson, Edward Palmer. 1964. The Making of the English Working Class. London: IICA.

Thornham, Helen. 2008. "It's A Boy Thing." Feminist Media Studies 8(2): 127-142. https://doi.org/10.1080/14680770801980505.

UNESCO. *Charter on the Preservation of Digital Heritage*. 2003.

United States Congress. Digital Millennium Copyright Act. 1998.

United States Copyright Office. 2003. "Rulemaking on Exemptions from Prohibition on Circumvention of Technological Measures that Control Access to Copyrighted Works." https://www.copyright.gov/1201/2003/index.html.

United States Copyright Office. 2018. "Section 1201 Exemptions to Prohibition Against Circumvention of Technological Measures Protecting Copyrighted Works." https://www.copyright.gov/1201/2018/index.html.

Vajawat, Bhavika, Prateek Varshney, and Debanjan Banerjee. 2021. "Digital Gaming Interventions in Psychiatry: Evidence, Applications and Challenges." *Psychiatry Research,* 295. 113585. https://doi.org/10.1016/j.psychres.2020.113585.

Valve Corporation. n. d. "Steam Store." Accessed December 2022. https://store.steampowered.com.

Williams, Raymond. 1958. *Culture and Society*. London: Chatto & Windus.