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Making Videogame History: Videogame Preservation and Copyright Law

1. Introduction

The long-term archiving and preservation of videogames has become a topic of increasing concern to the cultural heritage sector.[1] The continued accessibility of older videogames is threatened both by the rapid obsolescence of the hardware and software platforms on which they depend and the gradual degradation of the physical media on which they are stored, also known as 'bit rot'.[2] This is further exacerbated by the prevailing business model within the mainstream videogame industry, which continues to be structured around the 'newest' and 'latest' releases and the 'next generation' of gaming platforms, at the expense of older titles and hardware.[3] Historically, therefore, videogames have had a relatively short shelf-life compared to other types of media products, and developers of hardware and software platforms have had little incentive to ensure that the latest iterations of their products are 'backwards compatible' with older videogames.

It is true that there is, at present, a resurgence of interest in 'retro' or 'classic' videogame titles. This, combined with current digital distribution platforms, means players now have access to a much wider array of older titles than has previously been the case. For the purposes of preservation, however, videogames that are distributed in digital form carry their own risks, as their continued availability depends entirely on their publishers. While physical copies of videogames may continue to be bought and sold on the secondary market long after publishers have ceased to offer them for sale, digital-only videogames

[1] J Conley et al, 'Use of a Game Over: Emulation and the Video Game Industry, a White Paper' (2004) 2 Nw J Tech & Intell Prop 261; H Lowood et al, 'Before It's Too Late: A Digital Game Preservation White Paper (2009) 1 American Journal of Play 139; J McDonough et al, Preserving Virtual Worlds: Final Report (University of Illinois 2010); J Newman, 'Illegal Deposit: Game Preservation and/as Software Piracy' (2012) 19 Convergence 25.
[2] Lowood et al (n 1) 140 – 144; McDonough et al (n 1) 5.
[3] J Newman 'Save the Videogame! The National Videogame Archive: Preservation, Supersession and Obsolescence' (2009) 12 M/C Journal < http://journal.media-culture.org.au/index.php/mcjournal/article/view/167> accessed 30 August 2018.

effectively disappear from view the moment their publishers decide to remove them from the online marketplace. As the videogame industry appears to be moving towards a model of distribution that is exclusively digital in nature – even physical discs that are sold as boxed products may contain only a small portion of videogame data, with the remainder being downloaded during the installation process[4] – this makes the task of videogame preservation an even more urgent one.

2. Videogame preservation strategies and copyright law

2.1 Migration and emulation

To date, the most viable strategy that has been identified for overcoming the problems of obsolescence and bit rot involves the use of migration and emulation technologies.[5] Migration refers to the conversion of videogame data into a media-neutral storage format, which is typically done by creating an exact, bit-for-bit replica of the disk on which the videogame was originally stored. Depending on the nature of the original storage medium, the process of migration will result in the creation of either a ROM file (where videogame data is extracted from a Read-Only Memory chip such as those used in videogame cartridges and arcade system boards), an ISO file (where the data has been extracted from an optical disc such as a CD or DVD) or an IMG file (where the data has been extracted from either a magnetic disc such as a floppy disk or a hard drive, or an optical disc). Emulation technologies, meanwhile, enable videogames to be run on platforms other than

[4] See A Lober, S Klein and F Groothuis, 'The Long and Winding Road of Digital Distribution, or Why the ECJ's UsedSoft Decision is of No Use to Keysellers' (2018) 1 IELR 44, 50.
[5] Lowood et al (n 1) 140 – 147; McDonough et al (n 1) 52 – 57; J Barwick, J Dearnley and A Muir, 'Playing Games with Cultural Heritage: A Comparative Case Study Analysis of the Current Status of Digital Game Preservation' (2011) 6 Games and Culture 373, 381 – 382; MA Winget, 'Videogame Preservation and Massively Multiplayer Online Role-Playing Games: A Review of the Literature' (2011) 62 Journal of the American Society for Information Science and Technology 1869, 1872 – 1873.

those for which they were originally intended.[6] The Virtual Game Station, for instance, allows Sony PlayStation games to be played on contemporary personal computers, while the MAME program provides the same functionality in relation to arcade games.[7] However, migration and emulation technologies raise a number of issues under European copyright law.

2.1.1 Migration

The migration of videogame data into a different storage format requires nothing less than the wholesale copying of the videogame concerned. As videogames are protected as works under European copyright law,[8] this constitutes a potentially infringing act of reproduction if carried out without the prior authorization of the rightholder.[9]

Further complications arise in relation to videogames to which technological protection measures ('TPMs') intended to prevent unauthorized copying have been applied. In these cases, the successful migration of videogame data will first require the circumvention of these TPMs. In Nintendo Co Ltd v PC Box Srl ('Nintendo v PC Box'),[10] the CJEU held that videogames constitute complex subject matter comprising not only a computer program but also graphic and sound elements, and are accordingly protected as works under the regime established by the Information Society Directive. The Information Society Directive, in turn, requires Member States to provide adequate legal protection against the circumvention of effective TPMs that control access to a protected work.[11] On

[6] For an overview, see B Farrand, 'Emulation is the Most Sincere Form of Flattery: Retro Videogames, ROM Distribution and Copyright' (2012) 14 IDP 5, 7.
[7] 'MAME' was originally an acronym for 'Multiple Arcade Machine Emulator'.
[8] Case C-355/12 Nintendo Co Ltd v PC Box Srl ECLI:EU:C:2014:25.
[9] Information Society Directive, art 2.
[10] Case C-355/12, ECLI:EU:C:2014:25.
[11] Information Society Directive, art 6(1). In this, it is stricter than the corresponding provisions of the Software Directive, which only require Member States to provide appropriate remedies against the provision of means whose sole intended purpose is to facilitate the circumvention of TPMs that have been applied to computer programs: Software Directive, art 7(1)(c).

the face of it, therefore, the circumvention of TPMs for the purpose of migrating videogame data would amount to a contravention.

It is true that the CJEU did also state in Nintendo v PC Box that legal protection against circumvention should be granted only in relation to TPMs that are proportionate to the principal objective of preventing acts of infringement, noting that TPMs should not interfere unduly with acts that do not infringe copyright. This indicates that the protection afforded to TPMs is not absolute, and may well signal a somewhat more pro-user stance on the part of the CJEU where TPMs are concerned. However, it still stops well short of any recognition that the circumvention of TPMs may be lawful if carried out for a legitimate purpose. As the anti-circumvention provisions of the Information Society Directive are not expressed to be subject to any copyright exceptions and limitations, it is difficult to see how any acts of circumvention might be justified as a matter of law.

2.1.2 Emulation

The creation of emulation software, meanwhile, involves the reverse engineering of the operating system which it seeks to replicate, and is likely to call for the decompilation of parts of that system's program code.[12] This requires multiple acts of reproduction and adaptation,[13] all of which are potentially infringing.[14]

Within the limited literature in this area, there has been some suggestion that activities of this kind might be permitted under the Software Directive, which contains mandatory exceptions relating to the reverse engineering and decompilation of computer programs.[15] Article 5(3) of the Directive permits the lawful acquirer of a computer

[12] Decompilation refers to the process of converting computer code that is expressed in a lower-level language to a higher-level – and typically human-readable – language.
[13] The 'translation' of a computer program is an act falling within the rightholder's exclusive right of adaptation: Software Directive, art 4(1)(b).
[14] Software Directive, art 4(1).
[15] Farrand (n 6) 9 – 12. Courts in the US have held that acts of reverse engineering and decompilation that are carried out for the purpose of gaining access to the functions and ideas embodied in a computer program

program to observe, study and test its functioning without seeking prior authorization from the rightholder, while article 6(1) permits the lawful user of a computer program to engage in its decompilation where this is indispensable for obtaining the information necessary for achieving the interoperability of an independently-created computer program with other programs. The creation of an emulator program which is capable of interoperating with contemporary operating system would appear to be consistent with the stated purpose of article 6(1). While article 6(2) does stipulate that the information obtained through the process must not be used to develop a computer program that is 'substantially similar in its expression' to the one decompiled, this does not necessarily present a barrier to the creation of emulators. Although emulators are functionally similar to the operating systems they seek to replicate, the CJEU has held that the functionality of a computer program does not constitute a form of its expression, and is consequently not protected under the Software Directive.[16] However, even if the creation of emulation software was to be found a non-infringing act in itself, it might nevertheless give rise to some form of accessory liability in relation to infringements carried out by its users, on the basis that emulation software enables gamers to play unlawfully downloaded copies of videogames.[17] As the issue of accessory liability for copyright infringement has not yet been harmonized at the European level, this question would have to be determined under the national laws of each Member State, further complicating an already murky area of law.[18]

2.2 Online multiplayer games

amount to permitted fair uses, provided that there is no alternative means of gaining such access: Sega Enterprises Ltd v Accolade, Inc 977 F 2d 1510 (9th Cir 1992); Sony Computer Entertainment, Inc v Connectix Corporation 203 F 3d 596 (9th Cir 1999).

[16] Case C-406/10 SAS Institute Inc v World Programming Ltd ECLI:EU:C:2012:259.

[17] See Conley et al (n 1) 271 – 273.

[18] For a comprehensive analysis, see C Angelopoulos, European Intermediary Liability in Copyright: A Tort-Based Analysis (Wolters Kluwer 2017).

The preservation of videogames with a significant online and/or multiplayer component presents additional challenges of its own. These videogames typically require a connection to an external server maintained by the developer or publisher in order to operate. Because of this, they effectively become unplayable once the developer or publisher ceases to offer support for the videogame and terminates players' access to the server. In these circumstances, it will often be necessary for parts of such a videogame – in particular its software components – to be reproduced and modified to ensure its continued functionality. Any TPMs built into the original servers, such as authentication procedures, will also need to be circumvented to enable access to the videogame. Once again, these activities implicate the reproduction and adaptation rights of the rightholders concerned, as well as the anti-circumvention protections afforded to TPMs.

Because the social and communal aspects of online multiplayer games cannot be easily replicated through conventional preservation strategies that are aimed at ensuring the continued functionality of videogames, some digital media scholars have suggested that documentary strategies, which focus on capturing player performance, should also be adopted.[19] In addition to the reproduction rights of the rightholders in those videogames, these strategies may also implicate the intellectual property rights of players,[20] particularly where the videogame in question has been designed so as to encourage the production of user-generated content.[21]

2.3 Digital-only videogames

[19] H Lowood, 'Shall We Play a Game: Thoughts on the Computer Game Archive of the Future' (BITS OF CULTURE: New Projects Linking the Preservation and Study of Interactive Media, Stanford University, 2002), 15 – 16; Winget (n 5) 1880; J Newman, 'Online Games Preservation', The International Encyclopedia of Digital Communication and Society (2015) <https://doi.org/10.1002/9781118767771.wbiedcs037> accessed 30 August 2018.

[20] It is an open question as to whether players may acquire copyright or performers' rights in a particular playthrough of a videogame: see SM Kelly and KA Sigmon, 'The Key to Key Presses: eSports Game Input Streaming and Copyright Protection' (2018) 1 IELR 2.

[21] See McDonough et al (n 1) 89 – 97 (documenting difficulties in archiving 'islands' within Second Life, an online virtual world that prominently features user-generated content).

As alluded to earlier, videogames that are distributed exclusively in digital form raise yet another set of challenges for preservation. Where these videogames have been removed from circulation by their publishers, it may not be possible for a would-be purchaser even to acquire a lawful copy. Where videogames are distributed on physical storage media, they may continue to be available on the secondary market even after publishers have ceased to offer them for sale. Despite long-running objections from rightholders, the doctrine of exhaustion means that they are unable to control the resale of copies that were initially put on the market with their consent. At present, however, it is unclear as a matter of European copyright law whether the principle of exhaustion applies to digital copies of works that have not been incorporated into any physical medium.

Some cause for optimism was given to would-be resellers by the judgment in UsedSoft GmbH v Oracle International Corp ('UsedSoft'),[22] where the CJEU held that the principle of exhaustion applies both to digitally downloaded copies of software and copies that are sold on physical media, noting that relevant provisions of the Software Directive draw no express distinction between tangible and intangible copies.[23] UsedSoft was, however, handed down prior to Nintendo v PC Box, in which the CJEU recognized videogames as composite works protected under the Information Society Directive, rather than as computer programs falling within the remit of the Software Directive. This makes it very doubtful whether the reasoning in UsedSoft can be extended to computer programs at all.[24] In this context, it is worth noting that the CJEU has, in its post-UsedSoft discussions of the Information Society Directive, appeared to confine the principle of exhaustion to tangible copies of works.[25] Where digital-only videogames are concerned,

[22] Case C-128/11, ECLI:EU:C:2012:407.
[23] Software Directive, art 1(2) and recital 7.
[24] Lober, Klein and Groothuis (n 4) 48 – 49.
[25] Case C-419/13 Art & Allposters International BV v Stichting Pictoright EU:C:2015:27; Case C-174/16 Vereniging Openbare Bibliotheken v Stichting Leenrecht EU:C:2016:856. One of the questions referred to

therefore, would-be preservationists face the additional hurdle of ensuring lawful initial acquisition.

2.4 Orphan works and abandonware

The legal issues surrounding the preservation of videogames are further exacerbated by the difficulties of locating the relevant rightholders. Videogame development projects often involve complex contractual arrangements between multiple parties, with different sets of intellectual property rights being allocated to each party for varying lengths of time. The volatile nature of the videogame industry also means that the intellectual property rights in a given videogame may change hands multiple times, as firms are acquired, merged, split, or wound up. Quite often, this leads to situations where the rightholder of a particular videogame is completely untraceable. Even where a group of potential rightholders can be identified, it may well be impossible to ascertain which sets of rights belong to which entity.[26]

The difficulty of tracing and identifying rightholders may be ameliorated to some extent by the Orphan Works Directive, which creates a copyright exception in favour of cultural heritage institutions by allowing them to reproduce and make available to the public orphan works that are held in their collections.[27] A work acquires orphan status if, after a diligent search has been carried out, none of its rightholders can be identified or, if identified, cannot be located.[28] It should be noted, however, that the Orphan Works Directive is expressed to apply only to 'works published in the form of books, journals, newspapers, magazines or other writings' and 'cinematographic or audiovisual works and

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the CJEU in Tom Kabinet, which is currently pending before the court, relates to whether the Information Society Directive incorporates a general principle of digital exhaustion.

[26] H Maier, 'Games as Cultural Heritage: Copyright Challenges for Preserving (Orphan) Video Games in the EU' (2015) 6 JIPITEC 120, 120.

[27] Orphan Works Directive, art 6(1).

[28] Orphan Works Directive, art 2.

phonograms'.[29] While the judgment of the CJEU in Nintendo v PC Box confirms that videogames are to be treated as 'entire works' under the Information Society Directive, it still leaves it unclear what type of work a videogame should be classified as, and in particular whether it can be classified as a cinematographic or audiovisual work.[30]

In any event, even if the Orphan Works Directive were to be given a broad interpretation, it would still not be capable of resolving all the difficulties presented by 'abandonware', namely videogames that are no longer commercially distributed and for which no support is available.[31] Unlike orphan works, the rightholders of abandonware may be both known and locatable, but are simply uninterested in continuing to deal with the videogames concerned. While there may be some overlap between orphan works and abandonware, therefore, a videogame can be 'abandoned' without necessarily being 'orphaned'.[32] In such cases, the Orphan Works Directive is of little assistance to preservationists.

3. Potential solutions

3.1 Taking advantage of existing flexibilities

The legal complexities surrounding videogame preservation may leave cultural heritage institutions with the sense that their hands are tied. This sense of frustration is evident in an interview given by Andreas Lange, the curator of the Computerspiele Museum in Berlin, where he stated that 'we essentially have to stand there watching day after day as our

[29] Orphan Works Directive, art 1(2).
[30] Maier (n 26) 121 – 123.
[31] DWK Khong, 'Orphan Works, Abandonware and the Missing Market for Copyrighted Goods' (2007) 15 Int'l JL & Info Tech 54, 56.
[32] Khong (n 31) 57.

collection, one of the most significant collections [of video game culture] worldwide, demagnetizes'.[33]

Despite the fairly restrictive nature of the European copyright framework, however, it does still contain pockets of flexibility which the cultural heritage sector may be able to use as a starting point. As discussed previously, the mandatory exceptions of the Software Directive relating to reverse engineering and decompilation may provide institutions with sufficient freedom to develop their own emulation technologies. The risk of incurring accessory liability can be minimized if these technologies are kept 'in house' rather than being made available to the general public.

The Information Society Directive, meanwhile, contains a provision permitting Member States to legislate for exceptions relating to 'specific acts of reproduction made by publicly accessible libraries, educational establishments or museums, or by archives, which are not for direct or indirect economic or commercial advantage'.[34] This may allow cultural heritage institutions to create preservation copies of videogames, depending on its particular implementation under national law. The UK copyright legislation, for instance, contains an exception permitting a library, archive or museum to make preservation copies of items that form part of its permanent collection, provided that the purchase of a replacement copy is not 'reasonably practicable'.[35] This could be interpreted to permit cultural heritage institutions to make preservation copies of videogames that are held within their permanent collections and are no longer in commercial circulation, though it would still not enable them to circumvent any TPMs that have been applied to those videogames. In addition, while the Orphan Works Directive may not fully address the

[33] V Zainzinger, 'Saving the Game: Why Preserving Video Games is Illegal' (The Next Web, 22 April 2012) <https://thenextweb.com/insider/2012/04/22/saving-the-game-why-preserving-video-games-is-illegal/> accessed 30 August 2018.
[34] Information Society Directive, art 5(2)(c).
[35] UK Copyright, Designs and Patents Act 1988, s 42.

problem of abandonware, cultural heritage institutions can still take advantage of its permissions to engage in the preservation of videogames that can genuinely be classified as orphan works.

3.2 Collaboration with the videogame industry

Scholars working in the field of videogame preservation have advocated for closer collaboration between the cultural heritage sector and the videogame industry in order to overcome the legal issues identified above.[36] While the lack of co-ordinated preservation efforts within the industry has been documented by researchers,[37] there also appears to be growing recognition of the importance of preservation. For instance, a Game Preservation Special Interest Group was founded under the auspices of the International Game Developers Association in 2004, and in 2009, its members published a White Paper calling for heightened awareness of the issue.[38]

It is true that some videogame publishers have taken a dim view of migration and emulation technologies thus far. Nintendo's website, for instance, states that '[t]he introduction of emulators created to play illegally copied Nintendo software represents the greatest threat to date to the intellectual property rights of video game developers',[39] and the company has been active in enforcing its rights against third-party hosts of ROM files and emulators for Nintendo games.[40] However, this has been on the basis of the potential misuse of these technologies by players in general, and it does not necessarily follow that

[36] Conley et al (n 1) 276 – 280; Lowood et al (n 1) 144; Farrand (n 6) 14 – 15; Maier (n 26) 127.
[37] K Kraus and R Donahue, 'Do You Want to Save Your Progress? The Role of Professional and Player Communities in Preserving Virtual Worlds' (2012) 6 Digital Humanities Quarterly <http://www.digitalhumanities.org/dhq/vol/6/2/000129/000129.html> accessed 30 August 2018. See also Newman (n 1) 50 – 51; A Batchell and M Barr, 'Video Game Preservation in the UK: A Survey of Records Management Practices' (2014) 9 International Journal of Digital Curation 139, 155 – 156.
[38] Lowood et al (n 1) 139 – 151.
[39] Nintendo, 'Legal Information (Copyrights, Emulators, ROMs, Etc' (Nintendo.com) <https://www.nintendo.com/corp/legal.jsp> accessed 30 August 2018.
[40] See T Onanuga, 'All That's Wrong with Nintendo's Heavy-Handed ROM Crackdown' (Wired, 18 August 2018) <https://www.wired.co.uk/article/nintendo-roms-emulator-loveroms-loveretro-lawsuit> accessed 30 August 2018.

they would be equally opposed to the use of these technologies within the much more limited context of videogame preservation by cultural heritage institutions.[41]

To secure the support of the videogame industry, some commentators have argued that the cultural heritage sector should make greater efforts to highlight the commercial benefits of preservation projects.[42] For instance, developments in emulation technologies might allow the industry to capitalize on players' current interest in 'retro' videogames by offering updated versions that function efficiently on contemporary platforms, while a videogame repository could serve as a valuable reference and educational tool for future developers.

3.3 Legal reform

In the longer term, it may be necessary for the cultural heritage sector to lobby for legislative reforms that would give it greater flexibility to engage in videogame preservation projects, ideally with the support of the videogame industry. The present analysis has identified some areas for reform, with the existing prohibitions against the circumvention of TPMs being an obvious example. Recent developments in the US indicate a growing awareness that restrictive anti-circumvention laws present a significant barrier to the public's continued access to older videogames. US copyright legislation imposes a prohibition against the circumvention of TPMs that effectively control access to a protected work,[43] but also contains a 'fail-safe' mechanism allowing the Librarian of Congress to issue exemptions from this prohibition for specified classes of works whose use is likely to be adversely affected by it.[44] Pursuant to this rule-making power, the Librarian of Congress has adopted an exemption allowing the circumvention of authentication procedures that are necessary for gaining access to a videogame in

[41] See Lowood et al (n 1) 145.
[42] Conley et al (n 1) 277 – 278; Farrand (n 6) 14 – 15; Batchell and Barr (n 37) 143.
[43] US Copyright Act 1976, s 1201(1)(A).
[44] US Copyright Act 1976, s 1201(1)(C).

circumstances where the rightholder of the videogame has ceased to offer server support for that purpose.[45] The exemption can be invoked by lawful acquirers of videogames fitting that description, as well as cultural heritage institutions seeking to preserve those videogames in a playable form. Some cultural heritage institutions in the US have also requested a further exemption that would allow them to operate servers for online multiplayer games that are no longer supported by the rightholders.[46] These initiatives offer some possible models for reform.

4.0 Conclusion

Videogame preservation raises complex copyright issues. Conventional strategies such as migration and emulation implicate rightholders' exclusive reproduction rights, and are likely to put preservationists in breach of the anti-circumvention protections found in most copyright legislation. The preservation of online multiplayer games and digital-only videogames presents another set of challenges: attempts at capturing the social and communal aspects of the former may implicate players' rights in their user-generated content as well as those of rightholders, while the ongoing uncertainty as to whether the principle of exhaustion applies in the digital environment presents barriers for the lawful acquisition of digital-only videogames that are no longer commercially available. In many cases, these challenges are exacerbated by the difficulties of identifying and locating the relevant rightholders, and of ascertaining the ownership of different sets of rights.

Notwithstanding this, there remain flexibilities within the current copyright regime that potentially allow the cultural heritage sector to engage in at least some videogame

[45] Library of Congress, 'Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies (28 October 2015).
[46] E Van der Sar, 'Gamers Want DMCA Exemption for "Abandoned" Online Games' (TorrentFreak, 21 December 2017) <https://torrentfreak.com/gamers-want-dmca-exemption-for-abandoned-online-games-171221/> accessed 30 August 2018.

preservation projects. The mandatory exceptions in the Software Directive may provide institutions with sufficient freedom to develop their own emulation technologies, and institutions may be able to take advantage of the Orphan Works Directive to create preservation copies of videogames that have genuinely been ‘orphaned’. The Information Society Directive also permits Member States to legislate for exceptions relating to reproductions made by cultural heritage institutions, and some national implementations may permit institutions to make preservation copies of videogames under certain conditions. In the longer term, it may be worthwhile for the cultural heritage sector to seek out opportunities for collaboration with industry partners, and to lobby for legislative reforms that would remove the most significant barriers to videogame preservation.