

Games as Cultural Heritage

Copyright Challenges for Preserving (Orphan) Video Games in the EU

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A. Introduction

- 1 Preserving and digitising cultural heritage poses challenges on a conceptual, technical and legal level. This is particularly true for complex works such as video games. Their preservation is important, because games usually have a life span of about five years before a new system renders them practically obsolete.¹ They are however protected by copyright, and the term of protection exceeds this by decades.
- 2 The first mainstream game consoles date back to the 1980s² and many of the companies that developed games a couple of decades ago are out of business today.³ Information about the rightsholders, contracts, etc. was often lost, possibly also because the industry was so young. This led to a situation where many⁴ old video games today are so called abandonware⁵ and/or orphan works.⁶ For a good proportion of these games, it is difficult, if not impossible, to trace back the licensing agreements with the various authors and other rightsholders and determine which rights ended up with whom.⁷
- 3 From a technical point of view, currently the most sensible way of preserving video games is through emulation (mimicking the original system's environment).⁸ Partly because the copyright situation around this is complicated (see below) and rightsholders often cannot be located, cultural heritage institutions have usually chosen the "typical museum approach of 'technological preservation'",⁹ i.e. collecting and storing the original boxes, CDs, floppy disks etc. However, this is not a viable long-term solution, as the games, which are increasingly considered part of our cultural heritage¹⁰, often deteriorate on the shelves of these institutions.¹¹ While cultural heritage institutions go about challenges like this with some form of preservation concept, it is currently not these institutions, but mostly gaming enthusiasts who develop and use the great majority of emulators (usually for "retro-computing" and out of nostalgia for the games of their childhood).¹²
- 4 The orphan works problem in general has been discussed at length in the past few years,¹³ and in 2012, a European directive¹⁴ introduced a narrow exception for certain uses (including for preservation purposes) of certain types of orphan works. Video games, however, have rarely been included in the debate. In fact, none of the accompanying documents produced on a European level around the coming into force of the Orphan Works Directive appear to even mention games, despite the issue being particularly time sensitive for these kinds of works.¹⁵

- 5 This article sets out to clarify the legal status of orphan video games from a copyright perspective.¹⁶ It analyses whether the Orphan Works Directive also applies to orphan video games (i.e. if they can be considered a type of audiovisual work), and, if so, whether the directive's regime is suitable for the specifics of these complex, "multimedia" works.

B. Do video games fall under the Orphan Works Directive?

- 6 The Orphan Works Directive (in recital 1) points out the important role that museums and other cultural heritage institutions play in preserving and disseminating European cultural heritage. Therefore, as the EU Commission asserted in its impact assessment, the directive aims to "ensure lawful cross-border online access to orphan works" contained in these institutions "across Europe".¹⁷ To this end, the directive introduces an exception to copyright that privileges said cultural heritage institutions. A work is considered an orphan after a diligent search for the rightsholders was conducted, and this orphan work status has to be recognised across Europe (mutual recognition, Art. 4 Orphan Works Directive). The exception enables cultural heritage institutions to reproduce ("for the purposes of digitisation, making available, indexing, cataloguing, preservation or restoration" (Art. 6 Orphan Works Directive)) and make available to the public several types of orphan works from their collections, i.e. books and other writings, cinematographic or audiovisual works and phonograms (Art. 1 Orphan Works Directive).
- 7 As video games are not expressly listed in Article 1 of the directive (subject-matter and scope), the answer to this question depends on what we consider video games to be in terms of copyright. Do games constitute audiovisual works and are thus covered? While some voices in academic literature answer this question affirmatively, stating, for example, that "[...] the inclusion of cinematographic and audiovisual works would cover all recordings of moving images, including slide presentations and video games"¹⁸, a WIPO Study from 2013 demonstrates that the question of how to classify video games *in their entirety* has not been handled uniformly in all Member States.¹⁹
- 8 Furthermore, Germany, for example, transposed the Orphan Works Directive into national law²⁰, but did not use the term "audiovisuelle Werke" (audiovisual works, a term generally not used in the German Copyright Act), but only "Filmwerke" (cinematographic works), which is sometimes considered to be narrower and to possibly exclude video games.²¹ This raises several questions: Are the terms audiovisual works and cinematographic works

autonomous European terms or can each member state decide how to define them in their territory?²² Is there a way to classify video games in their entirety as audiovisual or cinematographic works?

I. A uniform interpretation of "cinematographic or audiovisual works"?

- 9 CJEU case law has long established that whether or not a term is to be independently interpreted on a European level depends on whether the directive refers to the national laws of the Member States.²³ If the directive expressly mentions the law of the Member States, the term can be interpreted and defined on a national level, if, however, the directive provides a definition itself, the term is to be uniformly interpreted in all Member States.²⁴
- 10 The case of "cinematographic or audiovisual works" is a little less clear cut. While both terms are mentioned in several directives,²⁵ they are not defined on a European level.²⁶ At the same time, the Orphan Works Directive also does not explicitly refer to the national laws of the Member States with regard to these terms. This becomes clear when looking at those parts of the directive that are directly addressed at Member States such as determining a fair compensation for the use of orphan works.²⁷ The wording here – "Member States shall be free to determine..." – is quite straightforward.
- 11 The CJEU reiterated settled case law in *Padawan/SGAE*, a case that dealt with the term "fair compensation" within the meaning of Article 5(2) (b) InfoSoc Directive, stating that: "[...] the need for a uniform application of European Union law and the principle of equality require that the terms of a provision of European Union law which makes no express reference to the law of the Member States for the purpose of determining its meaning and scope must normally be given an independent and uniform interpretation throughout the European Union".²⁸
- 12 As the reference to the different national laws is an exception to the harmonisation that directives otherwise intend, there is an assumption ("must normally be given") that the term ought to be independently interpreted.²⁹ CJEU case law requires that this assumption is backed up by the subject matter and purpose of the directive.³⁰ Recitals 8, 9 and 25 of the Orphan Works Directive state that the goal of the directive is to increase legal certainty for the use of orphan works by cultural heritage institutions and to allow cross-border access to orphan works. These reasons also led the European Commission to opt for the concept of mutual recognition of the orphan works status, which is

now a core part of the directive.³¹ One could argue that it does not matter whether only some Member States interpret, for example, audiovisual works in such a way that the transposed exception also covers video games because at least their classification as an orphan work in one Member State will then have to be recognized across Europe.³² However, the whole point of agreeing on certain types of works would be frustrated (and work against increasing legal certainty) if Member States could then interpret the term to mean vastly different types of works.

- 13 One constellation where the above-mentioned assumption may not apply is the case where an area of law is only partly harmonised.³³ Since the European copyright directives do not expressly harmonise the term “work” (apart from the conditions of copyright protection for computer programs³⁴, photographs³⁵ and databases³⁶), the different *categories* of works, one could argue, may not be uniformly interpreted in all Member States either. However, since its decision in *Infopaq*³⁷ the CJEU has been autonomously interpreting and specifying “the general condition for copyright protection and the protected subject matter of copyright law.”³⁸ Recent CJEU case law³⁹ has thus effectively harmonised at least parts of the term “work”⁴⁰ (tying it to the concept of the author’s “own intellectual creation”⁴¹). Further, the court has argued that diverging interpretations in different Member States with regard to exceptions and limitations⁴² would adversely affect the internal market.⁴³
- 14 With regard to the directives that are relevant to copyright law, the CJEU has only rarely opted to let the Member States interpret vague legal terms.⁴⁴ It therefore appears likely that the court would also interpret the different categories of works and non-original subject matter covered by the Orphan Works Directive autonomously. This would mean that Member States are not free to define the terms within their national laws, but must use the European terms.

II. Can games in their entirety be classified as audiovisual or cinematographic works?

- 15 What do these European terms entail? Are video games audiovisual and/or cinematographic works or something completely different? As mentioned above, the Orphan Works Directive does not include any definition.

1. Wording of the Directive

- 16 Art. 1 (2) (b) of the Orphan Works Directive refers to “cinematographic or audiovisual works and

phonograms contained in the collections of publicly accessible libraries, educational establishments or museums as well as in the collections of archives or of film or audio heritage institutions.” (Emphasis added.) The “or” could imply that the terms are not equivalent. However, the wording may also be simply due to the fact that some Member States only use the term “audiovisual works” and others only use the term “cinematographic works” in their respective copyright laws.⁴⁵

- 17 The choice of terms among the different copyright directives is also somewhat inconsistent. For example, even though other directives define “film” to mean audiovisual and cinematographic works as well as moving images, the Orphan Works Directive does not refer to films to describe subject matter and scope, but only mentions “cinematographic or audiovisual works and phonograms.” However, recital 20 of the directive states: “[...] Film or audio heritage institutions should, for the purposes of this Directive, cover organisations designated by Member States to collect, catalogue, preserve and restore *films and other audiovisual works or phonograms* forming part of their cultural heritage.” (Emphasis added.) This would imply that the European legislator might have assumed the term audiovisual works to be wider than the term film. It may also mean that the legislator did not mean to exclude non-original audiovisual subject matter (such as moving images)⁴⁶. Thus, reading the directive, it appears as though the term “audiovisual works” is to be understood in a broad way.

2. The Court of Justice of the EU’s Nintendo decision

- 18 In its *Nintendo*⁴⁷ decision, the CJEU was asked to interpret Art. 6 InfoSoc Directive (on the legal protection of technical protection measures), and in this context clarified which directive is applicable to video games, the InfoSoc Directive with its general copyright rules or the Software Directive with specific rules for software. The CJEU held:
- 19 “As is apparent from the order for reference, *videogames*, such as those at issue in the main proceedings, *constitute complex matter comprising not only a computer program but also graphic and sound elements, which, although encrypted in computer language, have a unique creative value which cannot be reduced to that encryption*. In so far as the parts of a videogame, in this case, the graphic and sound elements, are part of its originality, they are protected, *together with the entire work*, by copyright in the context of the system established by Directive 2001/29.”⁴⁸ (Emphasis added.)
- 20 Even though the Software Directive is *lex specialis* to the Infosoc Directive and all games are partly code, the CJEU held that some parts of the game

(“graphic and sound elements”) are protected under the InfoSoc directive. In copyright terms, a game is therefore more than a computer program. Further, it appears the CJEU implies that a video game does consist of different types of works, but that it also has some kind of *protection as a whole* (“together with the entire work”), which is more than the protection of the parts. One question this case raises is whether the distributive approach that some Member States have adopted for video games can be upheld. One may interpret the cited decision as mandating a “unitary legal treatment” of video games under the InfoSoc Directive.⁴⁹ The CJEU’s *BSA* decision however may support the distributive approach.⁵⁰ In any case, the *Nintendo* decision explicitly mentions a protection for the “entire work” under the InfoSoc Directive. Thus, even if different directives apply to different parts of a video game, the *Nintendo* case appears to suggest that games *in their entirety* can still – possibly additionally – be *classified* as a specific type of complex work. This may be a known type of complex work, i.e. an audiovisual or cinematographic work.⁵¹ But because the CJEU’s understanding of the term “work” is open and not tied to a closed list of copyright-protectable works⁵², it is also possible that computer games in their entirety are a new type of work that is protected under the InfoSoc directive, for example a multimedia work.⁵³ With regard to the question of whether video games can be classified specifically as audiovisual works, the decision thus does not provide very much guidance.

- 21 Some scholars who attempted to fit games into one category of works came to the conclusion that games are such multimedia works, because those works are understood to “combine on a single medium more than one different kind of expressions in an integrated digital format, and which allow their users, with the aid of a software tool, to manipulate the contents of the work with a substantial degree of interactivity.”⁵⁴ However, the term “multimedia work” does not exist in any of the European copyright directives.⁵⁵ Can such multimedia works *also* be classified as audiovisual or cinematographic works for the purpose of the Orphan Works Directive⁵⁶?
- 22 What video games and movies certainly have in common is that they are complex works that combine different types of works in one medium. For both, the audiovisual elements are the focus, at least from the perspective of the user. So what could stand in the way of a classification of video games as audiovisual works?

3. Audiovisual works within an audiovisual work?

- 23 As mentioned above, courts have sometimes considered games to have graphic and sound

elements that are themselves protected as audiovisual or cinematographic works.⁵⁷ One may think that since a part of the game is already a cinematographic work, the work as a whole cannot be, because different types of works are added to the audiovisual elements. While it may sound odd that an audiovisual work can be comprised of more audiovisual works, this is possible for other categories of works as well. A part of a book could be protected as a literary work, and still, the book as a whole would be protected as a literary work as well. Its complexity and bundling of different types of works is even characteristic of an audiovisual work.⁵⁸

4. Code

- 24 Every video game also entails source code and object code (primary game engine(s), ancillary code, plugins and comments).⁵⁹ Therefore, courts have often split up games into audiovisual works and computer programs.⁶⁰ However, animated movies, for example, depend on code⁶¹ and would nevertheless be classified as cinematographic or audiovisual works.⁶² There are of course differences between animated movies and video games, namely that the interactivity of the games requires a constant control by computer programs whereas animated movies are sometimes generated *with the help* of a 3D graphics program, but do not require a computer program integrated in the work to play the animated scenes.⁶³ Some movies, however, have animated parts, which are directly generated through programming in a given programming language, and thus partly constitute computer programs.⁶⁴ While it is important to evaluate whether a part of a given product is a computer program in the sense of the Software Directive or the respective national laws, it does appear odd and somewhat contrary to the Orphan Works Directive’s objectives to imagine that based on this distinction some works (that are “purely” audiovisual) may be covered, while those that partly consist of computer programs are not.
- 25 If one were to split up animated films or games into these two main elements (audiovisual parts and computer programs), it is unlikely that they would fall under the directive in their entirety. Their audiovisual elements would be covered, but in order to preserve the work, the binary code also needs to be copied. It seems questionable whether such a computer program could be considered a type of “other writing” in the sense of Art. 1 (2) (a) Orphan Works Directive. While the term is broad and Member States often protect code as a type of literary work⁶⁵, the directive is likely intended to apply only to *printed* works (including electronic printing) such as the listed examples “books, journals, newspapers, magazines”.⁶⁶

5. Interactivity

26 One major difference between games and regular movies is that games are designed to be interactive⁶⁷ while movies are generally linear and designed to be shown. These lines may blur, but it is true that some games leave so many options to the user that the players can come up with things the game studio did not even conceive of.⁶⁸ It does, however, appear questionable whether this difference in the way the work is put to use is really of importance. For example, Art. 3 (3) of the Satellite and Cable Directive refers to “cinematographic works *including* works *created* by a process analogous to cinematography.”⁶⁹ (Emphasis added.) Cinematographic works in the sense of this directive thus include all works that are created in an analogous way – independent of whether they are *used* in a similar way. This would be an easier case to argue for video games as they, like movies, are often developed by a team, can have high production costs, and require equivalent planning and conceptualising from idea and setting, to characters, sound effects or music.⁷⁰ Of course, this specification of cinematographic works cannot be found in the Orphan Works Directive (or in any other directive apart from the Cable and Satellite Directive) and the term could mean different things in different directives. However, particularly with regard to copyright law, this is an exception, and the principle of consistency would support a uniform interpretation, even across directives.⁷¹

6. Possible inconsistencies or odd consequences

27 It is important to note that a consistent classification of video games in their entirety as cinematographic or audiovisual works would then also mean that games fall under the other directives that use the terms cinematographic or audiovisual works or film, i.e. the Rental Directive (Art. 2 (1) (c) defines ‘film’ as “a cinematographic or audiovisual work or moving images, whether or not accompanied by sound”), the Term Directive and the Satellite and Cable Directive. In some instances, this does not appear to fit well, and it seems likely that the legislator at least did not have games in mind when drafting or revising these directives.⁷² Further, a classification of games as audiovisual or cinematographic works may have effects on a national level for Member States with special copyright provisions for films in their copyright laws, for example with regard to authorship,⁷³ transfer of rights⁷⁴ or moral rights⁷⁵. While courts in some Member States have not considered games a type of audiovisual work and have thus avoided the application of specific regimes for films⁷⁶, courts in other countries have long applied these provisions to games as well.⁷⁷

28 Overall, there are some compelling arguments supporting the notion that video games in their entirety are in fact audiovisual or cinematographic works for the purpose of the Orphan Works Directive. A clarification with regard to the directive’s scope may nevertheless be helpful and could be included in the review process, which will require the Commission to submit a report by 29 October 2015 concerning the possible expansion of the directive’s scope (see Art. 10 (1) Orphan Works Directive).

C. Emulation of video games – do the orphan works provisions fit at all?

29 Assuming that video games can be considered audiovisual or cinematographic works in the sense of the Orphan Works Directive, what consequences would this have for orphan games?

30 An initial reading may lead to the conclusion that games could then be reproduced and made available to the public (by the relevant cultural heritage institutions, for the specific purposes listed in the Directive). However, the archiving and preservation of games is different from archiving and preserving the rest of the subject matter of the directive and it appears questionable whether the orphan works exception in its current form would legalise any meaningful preservation processes with regard to video games.

I. Technical aspects of emulation

31 To analyse whether the Orphan Works Directive – provided that it is applicable to video games – is helpful, it is important to get a basic understanding of what is technically necessary in order to preserve such games.

32 There are different preservation techniques; apart from the above-mentioned technological preservation the two prevalent approaches are migration and emulation. Because migration entails the moving and conversion of digital objects into formats that are readable today, this process can be done for individual documents like texts or pictures, but it is considered ill-suited for complex works such as video games.⁷⁸

33 The idea behind emulation, on the other hand, is to mimic the *original system’s environment* and therefore enable “the computer running the emulator to use most software designed for the emulated hardware.”⁷⁹ Emulation thus does not start with changes in the object itself, but attempts to recreate its original environment. Through this process it is possible, for example, to play an old game from a floppy disk on a computer today (that does not

have a floppy disk drive). With the help of emulators that provide conversion software, a game's "original functionality, look, and feel"⁸⁰ can thus be recreated. The process is complex though, as not only the object itself, but also the application it uses, the operating system and drivers ought to be archived.⁸¹ Emulation can target different "layers" (application, operating system, hardware), but often emulators for games emulate at least some hardware components.⁸² The process requires the programmer to understand the original program or system in order to write his/her own program with functions resembling the old program or system.⁸³ Ideally, he/she would therefore need access to the original source code or at least to the hardware specifications. As that is often not available, the way to understand the "inner workings" of the relevant hard-/software is decompiling the object code through reverse engineering.⁸⁴

- 34 Furthermore, because the old devices that read floppy disks or cartridges are not available anymore for new computers, it is essential to make digital copies of the storage media. These are called "images".⁸⁵
- 35 The result of the emulation process is a sort of "frame" in which the original data stream can be put into execution.⁸⁶ The process raises several issues with regard to copyright, which in turn are relevant for the effectiveness of the orphan works exception.

II. Copyright aspects

1. Reverse engineering

- 36 Reverse engineering may be necessary in order to decompile the original hardware, firmware or the application that runs a given game. Art. 6 of the Software Directive addresses this issue. The provisions allow the reproduction of the code and translation of its form without authorisation from the rightholder where this is indispensable to obtain the information necessary to achieve the interoperability of an independently created computer program with other programs. There are further conditions, i.e. that the actions are performed by a licensee or lawful user (which a cultural heritage institution would likely be), that the necessary information is not quickly and easily accessible, and that the acts are confined to the parts of the original program that are necessary in order to achieve interoperability. As cultural heritage institutions would aim to achieve interoperability between the "old Multimedia Works and current computer environments", they can likely fulfil the requirements of this exception.⁸⁷

2. Technical protection measures

a.) Legal protection of technical protection measures

- 37 Generating an "image" (see above) is essentially making a copy of a given video game and its original storage media layout. This affects the exclusive reproduction right (Art. 2 InfoSoc Directive) of the copyright owner. The Orphan Works Directive allows cultural heritage institutions to make reproductions of the items they hold in their collections. However, what makes video games different from the rest of the directive's subject matter is that the majority of games are set up with technical protection measures that aim to prevent copying,⁸⁸ whatever its purpose. The CJEU clarified in *Nintendo* that with regard to video games, the provisions on technical protection measures contained in the InfoSoc Directive have to be applied (see above). According to Art. 6 (1) of the InfoSoc Directive, Member States shall provide adequate legal protection against the circumvention of any effective technological measures. It follows that if technical protection measures cannot be circumvented legally, many orphan games also cannot be archived without infringing copyright. The relationship between exceptions and technical protection measures is thus crucial for determining the effectiveness of the orphan works provisions when it comes to video games.

b.) A right to hack for orphan video games?

- 38 There is no general "right to hack" for the user whose intended use of a work is legal under an exception, but prevented by technical protection measures.⁸⁹ The directive relies on voluntary measures by rightsholders to enable users to benefit from exceptions, and in absence of such voluntary measures, Member States "should take appropriate measures to ensure that rightholders provide beneficiaries of such exceptions or limitations with appropriate means of benefiting from them" (Recital 51). However, Art. 6 (4) InfoSoc Directive also only lists certain exceptions that need to be made available, the exception for private copying, for example, *may* but does not have to be, included in the "measures" Member States take. In Germany, this led to a situation where digital copies for private uses are legal under certain (strict) conditions, however, if the work is protected by technical protection measures, rightsholders are only required to make available the benefit of the exception to those users who want to make *analogue* private copies.⁹⁰
- 39 As the rightsholders of orphan works (per definition) cannot be located or found, an amendment of the provisions in the InfoSoc Directive to include the

new exception in the list in Art. 6 (4) would not have made sense. Is there thus a way to legitimise a “right to hack” in this special situation?

40 In *Nintendo* the CJEU stated that “[t]he legal protection referred to in Article 6 of that directive applies only in the light of protecting that rightholder against acts which require his authorisation.”⁹¹ However, this does not necessarily equal the right to circumvent the technical protection measures if one’s use does not require authorisation. Rather, the scope of the legal protection of technical protection measures seems to have to be determined more abstractly. To do this, the CJEU leaves it to the national courts to examine, inter alia, “the purpose of those devices, products or components” used to circumvent the technical protection measures, and “the evidence of actual use which is made of them”.⁹² The national courts thus have to compare how often a device is used to circumvent in order to infringe copyright, and how often the circumvention enables non-infringing actions.⁹³

41 Therefore, it appears as though currently, the orphan works exception’s effectiveness is greatly limited by technical protection measures. To be certain, cultural heritage institutions would possibly have to build a device to circumvent these measures where they could prove that it is almost exclusively used for non-infringing uses.

c.) The role of legal deposits

42 In some Member States such as France, Denmark or Finland, the national laws provide that certain cultural heritage institutions receive copies of video games to preserve them. For example, under French law, computer games must be deposited at the Bibliothèque nationale de France “with appropriate access codes.”⁹⁴ In Germany on the other hand, video games are excluded from the legal deposit requirement, which means cultural heritage institutions do not have such access.⁹⁵ The access codes likely only help with regard to technological preservation because they allow the game to be played on the system it was originally designed for, but not to be reproduced in order to, for example, generate an “image”. Overall, the laws on legal deposits, while being very important to game preservation, differ from country to country⁹⁶, and sometimes even within the different states in one country, which puts some institutions in a better position with regard to game preservation than others.

d.) Reproduction or adaptation?

43 Another question is whether an “image” really only entails a 1:1 copy or whether some alterations to the

data are necessary. Usually, changes to the digital document are not required.⁹⁷ There are however cases where the binary code needs to be slightly altered; to overcome technical protection measures, change the format of the data in order to make it readable for the emulator, and because emulation processes are also not necessarily flawless and without loss.⁹⁸ The necessity of at least minor alterations thus cannot always be precluded with certainty. With regard to the InfoSoc Directive, the CJEU has considered some alterations to a poster (i.e. alterations to its physical medium) to constitute reproductions and has left open the question of whether the right of adaptation is also harmonised on a European level and if so, what it would entail.⁹⁹ The Software Directive (in Art. 4 (b)) on the other hand, clearly distinguishes between the reproduction right and the right to alter the computer program.¹⁰⁰ As the changes would not simply affect the game’s medium, but also the binary itself, it appears questionable whether the Orphan Works Directive would still cover this alteration as a form of reproduction.

44 This point illustrates that the directive’s focus on reproduction and making available to the public is not really fitting for video games. However, even with regard to works less complex than games, emulation is increasingly regarded as a useful preservation strategy.¹⁰¹ Therefore, this issue will inevitably become increasingly relevant.

e.) The role of voluntary contractual systems for abandonware

45 The topic of abandonware is closely related to the orphan works problem. If there is no more commercial interest tied to a game, chances appear to be higher that information about the rightsholders gets lost. For games that have (or are about to) become abandonware, voluntary contractual systems can play an important role. Companies that decide to stop distributing a specific game may decide to license it as freeware, meaning that users can download it free of charge.¹⁰² In order to ensure ongoing support, the source code of the game engine will sometimes be released under a free software licence,¹⁰³ which allows user communities to take care of fixing bugs etc. themselves. If the company chooses a free software licence, this allows users to study, share and modify the software¹⁰⁴, so that many of the issues described above do not apply.¹⁰⁵ These licences are also “viral,” meaning that subsequent modifications to the software cannot be appropriated, because they also have to be made available under the free software licence.¹⁰⁶ Such free software licences are thus helpful for game emulation as well. However, these agreements require that the game in question is not yet an orphan, because only the copyright holders can

(re)license the work in question.¹⁰⁷ As mentioned above, an unclear copyright situation is however rather common for old video games, especially if the original company went out of business.¹⁰⁸ Voluntary contractual systems can thus (only) serve as a tool to avoid abandonware becoming orphan works in the first place.

D. Conclusion and outlook

46 While there are some compelling arguments for considering that the (mandatory) European exception in the Orphan Works Directive is also applicable to video games, cultural heritage institutions need to also consider other copyright provisions that will greatly limit the effects of this directive. The legal protection of technical protection measures will likely pose the main obstacle to preservation efforts. As there is no “right to hack,” it is illegal to circumvent the technical protection measures that many video games are equipped with. Further, the system of the InfoSoc Directive that requires rightsholders to enable users to benefit from certain exceptions is not helpful for orphan works. With regard to the uses the directive allows, a strict distinction between a 1:1 reproduction and an alteration appears difficult when copying videogames. Overall, the European legislator thus has likely assumed a relatively broad understanding of audiovisual works in the Orphan Works Directive that would also cover video games, but did not take into consideration the specificities of these works.

47 In order to make the exception effective with regard to video games, it appears important to enable cultural heritage institutions to legally circumvent technical protection measures for the uses that are covered by the directive. National laws with regard to legal deposits can be helpful in order to prevent future loss of video games, but do not help with regard to the currently large number of orphan video games. Similarly, voluntary contractual systems have been helpful for games that are about to become abandonware, but they require clarity with regard to who the rightsholders of a given game are. These licenses are thus also helpful for preventing future orphan works, but cannot solve the current issue in its entirety.

48 In the context of the general copyright reform debate, it appears important to note that whatever provisions may be tweaked, the European and national legislators should keep in mind the importance of video games as part of our cultural heritage, and the specific difficulties that come with preserving such complex digital works.

1 Conley *et al.*, *Use of a Game Over: Emulation and the Video Game Industry*, A White Paper, 2 Nw. J. Tech. & Intell. Prop. 2004, 261, at p. 270. Apart from this planned obsolescence,

the storage media also do not last longer than 20 years, see *Loebel*, *Lost in Translation: Leistungsfähigkeit, Einsatz und Grenzen von Emulatoren bei der Langzeitbewahrung digitaler multimedialer Objekte am Beispiel von Computerspielen*, at p. 15.

- 2 See *Greenspan/Boyd/Purewal*, *Video Games and IP: A Global Perspective*, WIPO Magazine 2/2014, available at http://www.wipo.int/wipo_magazine/en/2014/02/article_0002.html; the first video games such as *Spacewar* are more than 50 years old, see *Ramos Gil de la Haza*, *Video Games: Computer Programs or Creative Works?*, WIPO Magazine 4/2014, available at: http://www.wipo.int/wipo_magazine/en/2014/04/article_0006.html. All websites last checked on August 20, 2015.
- 3 See *van der Hoeven, et al.*, *Legal Aspects of Emulation*, iPres 2010 (Vienna), available at: <https://fedora.phaidra.univie.ac.at/fedora/get/o:245907/bdef:Content/get>, at 4.1.
- 4 The *Computerspielemuseum* in Berlin estimates that around 50 % of their collection consists of at least partial orphans.
- 5 Abandonware means software (such as old video games), which is no longer commercially distributed/sold and for which product support is no longer available. It is thus “abandoned” by its manufacturer. Many games that are abandonware are also orphan works.
- 6 Orphan works are works still protected by copyright whose owner is unidentifiable or untraceable.
- 7 See *van der Hoeven, et al.*, *op. cit. supra* note 3, at 4.1. As developer Maciej Miłsik pointed out at the #SaveGame workshop, developers are themselves not always sure of the conditions of the licence agreements for the games they developed several decades ago, see *Böck*, *Computerspiele können kaum legal archiviert werden*, available at: <http://www.golem.de/news/urheberrecht-computerspiele-koennen-kaum-legal-archiviert-werden-1504-113802.html>.
- 8 *Loebel*, *op. cit. supra* note 1, at p. 39. For a more detailed explanation of emulation see below, part B. I.
- 9 *Barwick, et al.*, *Playing Games With Cultural Heritage: A Comparative Case Study Analysis of the Current Status of Digital Game Preservation*, 6 *Games and Culture*, 2011, 373, at p. 381.
- 10 Several Member States’ laws on legal deposits include video games, for example, Finland (see The National Library of Finland, legal deposit requirements, available at: <http://www.nationallibrary.fi/publishers/legaldeposit/recordings.html#Videogames>), France (see *Lasfargues et al.*, *Legal deposit of the French Web: harvesting strategies for a national domain*, international Web Archiving Workshop, Aarhus (2008), available at: <https://hal.archives-ouvertes.fr/hal-01098538/document>) or Denmark (see European Federation of Video Game Archives, Museums and Preservation Projects (EFGAMP), The Royal Library (of Denmark), available at: <http://www.efgamp.eu/the-royal-library-denmark/>). Similarly, in the US, the Library of Congress has about 3,000 video games in their collection, see *Owens*, *Yes, The Library of Congress Has Video Games: An Interview with David Gibson*, September 09, 2012, available at: <http://blogs.loc.gov/digitalpreservation/2012/09/yes-the-library-of-congress-has-video-games-an-interview-with-david-gibson/>.
- 11 *Barwick, et al.* also point out that games, which are inherently interactive, require a different kind of presentation from other objects in cultural heritage institutions because it is important to keep the software alive and enable people to experience the game as a player, *op. cit. supra* note 9, at p. 385.
- 12 *Loebel*, *op. cit. supra* note 1, at pp. 135 et seq. Commercial emulators exist as well, though, due to their lack of portability/independence from a specific platform, they are not suitable for long-term archiving, see *ibid.* at p. 140.
- 13 See e.g. *van Gompel*, *Unlocking the Potential of Pre-Existing Content: How to Address the Issue of Orphan Works in*

- Europe? IIC, 2007, 669; *Grünberger*, Digitalisierung und Zugänglichmachung verwaister Werke, ZGE 2012, 321; *Teng*, The orphan works dilemma and museums: an uncomfortable straitjacket, 2 JIPLP, 2007, 30; *de la Durantaye*, How to Build an Orphanage and Why, 2 JIPITEC, 2011, 226; *van Gompel & Hugenholtz*, The Orphan Works Problem: The Copyright Conundrum of Digitizing Large-Scale Audiovisual Archives, and How to Solve It, Amsterdam Law School Legal Studies Research Paper No. 2012-10, 2012; *Klass & Rupp*, Die Digitalisierung des europäischen Kulturerbes, ZUM, 2013, 760; *Rosati*, The Orphan Works Directive, or throwing a stone and hiding the hand, 8 JIPLP, 2013, 303; *Peifer*, Die gesetzliche Regelung über verwaiste und vergriffene Werke, NJW, 2014, 6; *Möller*, Verwaiste Werke – Eine Analyse aus internationaler Perspektive, 2013; *Favale*, et al., Copyright, and the Regulation of Orphan Works: A comparative review of seven jurisdictions and a rights clearance simulation, 2013, available at: <http://www.create.ac.uk/publications/copyright-and-the-regulation-of-orphan-works/>. For the US see e.g. *Hansen*, et al., Solving the Orphan Works Problem for the United States, 37 COLUM. J.L. & ARTS 1, 2013, 1.
- 14 2012/28/EU, hereafter Orphan Works Directive.
 - 15 Unlike for other media, a lack of preservation for games will in many cases lead to the loss of the items as there is no “‘comfort zone’ to allow retrospective collecting”, *Barwick*, et al., op. cit. *supra* note 9, at p. 385.
 - 16 For emulating hardware, patent protection and the special protection for semi-conductors (Topographies of Semiconductors Directive, 87/54/EEC) may be relevant as well. These questions have already been addressed, e.g. by *van der Hoeven*, et al., op. cit. *supra* note 3, at 8.1. et seq. This paper focuses on copyright and orphan works, as this issue has not been yet been thoroughly analysed for video games.
 - 17 European Commission, Impact Assessment on the Cross-border Online Access to Orphan Works, SEC (2011) 615 final, May 24, 2011, at p. 14.
 - 18 *Suthersanen/Frabboni* in: *Stamatoudi/Torremans* (eds.), EU Copyright Law – A commentary (2014), at 13.13. As is the case for many of the texts dealing with this question, the commentary does not provide an explanation for this assessment.
 - 19 *Ramos*, et al., The Legal Status of Video Games: Comparative Analysis in National Approaches, 2013, available at: http://www.wipo.int/export/sites/www/copyright/en/creative_industries/pdf/video_games.pdf. The study does not only cover EU countries and also not all Member States. It however finds that e.g. “Belgium is apt to protect video games as audiovisual works, which entails a specific regime for authorship and transfer of rights” (p. 19) whereas some Member States adopt a “distributive approach”, where “each component must be subject to the legal status applicable to it (e.g., software, music, script or graphics)” (pp. 36, 41).
 - 20 The law from October 1, 2013 amended the Germany Copyright Act (Urhebergesetz) and came into force on January 1, 2014.
 - 21 *Peifer*, Die gesetzliche Regelung über verwaiste und vergriffene Werke, NJW 2014, 6, at p. 8; similarly *Spindler*, Ein Durchbruch für die Retrodigitalisierung? Die Orphan-Works-Richtlinie und der jüngste Referentenentwurf zur Änderung des Urheberrechts, ZUM 2013, 446, at p. 450. German courts have however long applied the special provisions for moving images and cinematographic works to electronic games, see e.g. *Hanseatisches Oberlandesgericht Hamburg*, GRUR 1983, 436; *OLG Hamburg*, GRUR 1990, 127, at p. 128; *BayObLG*, GRUR 1992, 508.
 - 22 See e.g. *Kamina*, The subject-matter for film protection in Europe, in: *Derclaye* (ed.), Research Handbook on the Future of EU Copyright (2009), at p. 88, arguing (with regard to the Rental and Lending Directive, Satellite and Cable Directive, Term Directive, and InfoSoc Directive) that the “definition of audiovisual works does not seem to be within the scope of harmonization.”
 - 23 See, for example, Case C-467/08 *Padawan/SGAE* [2010], paragraph 32.
 - 24 *Leenen*, Die Auslegung von Richtlinien und die richtlinienkonforme Auslegung und Fortbildung des nationalen Rechts, JURA 2012, 753, at p. 767; *Riesenhuber* in: *Riesenhuber* (ed.), Europäische Methodenlehre (2015), at § 10 margin number 4.
 - 25 Apart from the Orphan Works Directive (Art. 1(2)(b)) also in the Rental and Lending Directive (Art. 2) and the Term Directive (Art. 3 (3)).
 - 26 In fact, even on an international level, audiovisual works are not defined under the Universal Copyright Convention, the TRIPs Agreements or the WIPO Copyright Treaty of 1969 (each of these only mentions the term). The only international definitions can be found in the WIPO Draft Model Provisions that state in Art. 2 (1) that audiovisual works are “works consisting of a series of related images and accompanying sounds, if any, which are intended to be shown by appropriate devices”, and in Art. 2 Treaty on the International Registration of Audiovisual Works (Film Register Treaty), which states that for the purposes of the Treaty, audiovisual work “means any work that consists of a series of fixed related images, with or without accompanying sound, susceptible of being made visible and, where accompanied by sound, susceptible of being made audible.” The application of the Film Register Treaty has however been suspended, see WIPO, Document A/35/14, Matters concerning the treaty on the international registration of audiovisual works, 08/18/2000, paragraph 5.
 - 27 Art. 6 (5) of the Orphan Works Directive reads: “Member States shall be free to determine the circumstances under which the payment of such compensation may be organised. The level of the compensation shall be determined, within the limits imposed by Union law, by the law of the Member State in which the organisation which uses the orphan work in question is established.” Similarly, Article 5 (concerning the end of the orphan works status) and Art. 3 (2) (concerning the sources for the diligent search) are also worded clearly with respect to leaving certain tasks to the Member States.
 - 28 CJEU, Case C-467/08 *Padawan/SGAE* [2010], paragraph 32. See also, in particular, CJEU, Case C-327/82 *Ekro* [1984], paragraph 11; Case C-287/98 *Linster* [2000] paragraph 43; Case C-5/08 *Infopaq International* [2009] paragraph 27; Case C-34/10 *Brüstle* [2011] paragraph 25; Case C-128/11 *UsedSoft* [2012], paragraph 39; and, recently, despite of the optional nature of the exceptions in Art. 5 (3) (k) InfoSoc Directive, CJEU, Case C-201/13 *Deckmyn* [2014] paragraphs 15 et seq.
 - 29 See also *Riesenhuber*, op. cit. *supra* note 24, at § 10 margin number 6.
 - 30 See e.g. the CJEU’s reasoning in case C-128/11 *UsedSoft* [2012], paragraph 41.
 - 31 See European Commission, Proposal for a Directive of the European Parliament and of the Council on certain permitted uses of orphan works COM(2011) 289 final; European Commission, Impact assessment on the cross-border online access to orphan works, SEC(2011)615s, pp. 20 et seq., 33 et seq. For an analysis of the different options to deal with orphan works that European Commission had considered, see *de la Durantaye*, op. cit. *supra* note 13.
 - 32 This refers to the works covered by the Directive, which are works first published or broadcast in a Member State. The works that are e.g. covered by the UK licensing scheme for orphan works and were first published or broadcast outside the EU would not be subject to mutual recognition of the status as orphan, see *Rosati*, The Orphan Works Provisions of the ERR Act: Are They Compatible with UK and EU Laws? Available at: <http://ssrn.com/abstract=2323393>, at p. 15.

- 33 See ECJ, Case 105/84, *Danmols Inventar* [1985], paragraphs 26 et seq.; *Riesenhuber*, op. cit. *supra* note 24, at § 10 margin number 7.
- 34 Art. 1(3) Software Directive, which reads: “A computer program shall be protected if it is original in the sense that it is the author’s own intellectual creation. No other criteria shall be applied to determine its eligibility for protection.”
- 35 Art. 6 Term Directive 2006/116/EC: “Photographs which are original in the sense that they are the author’s own intellectual creation shall be protected in accordance with Article 1. No other criteria shall be applied to determine their eligibility for protection. Member States may provide for the protection of other photographs.”
- 36 Art. 3(1) Database Directive: “In accordance with this Directive, databases which, by reason of the selection or arrangement of their contents, constitute the author’s own intellectual creation shall be protected as such by copyright. No other criteria shall be applied to determine their eligibility for that protection.”
- 37 CJEU, Case C-5/08 *Infopaq International A/S* [2009].
- 38 *Leistner*, Europe’s copyright law decade: Recent case law of the European Court of Justice and policy perspectives, CML Rev. 2014, 559, at p. 561.
- 39 See e.g. CJEU, Case C-5/08 *Infopaq International A/S* [2009], paragraphs 31 et seq.; CJEU, Case C-393/09 *BSA* [2010], paragraphs 44 et seq.; CJEU, Joined Cases C-403/08 and C-429/08 *APL* [2011] paragraphs 96 et seq.
- 40 For an analysis of the methodological-critical readings of the CJEU’s autonomous interpretation of the term, see *van Eechoud*, Diverse Readings of the Court of Justice Judgments on Copyright Work, JIPITEC 2012, 60, at pp. 72 et seq.; *von Lewinski*, Introduction: The Notion of Work under EU Law 63 GRUR Int, 2014, 1098.
- 41 For a more specific look at the general condition as well as the parameters and criteria the CJEU developed for specific types of works see, particularly, *Leistner*, op. cit. *supra* note 38, at pp. 561 et seq.; *Metzger*, Der Einfluss des EuGH auf die gegenwärtige Entwicklung des Urheberrechts, GRUR 2012, 118, at pp. 121 et seq.; *Rosati*, Closed subject-matter systems are no longer compatible with EU copyright GRUR Int. 2014, 1112, at pp. 1114 et seq. With regard to the reception of the CJEU’s case law in Germany, see *Bisqes*, Der europäische Werkbegriff und sein Einfluss auf die deutsche Urheberrechtentwicklung, ZUM 2015, 357.
- 42 CJEU, Case C-435/12 *ACI Adam* [2014], paragraph 34. The case concerns the InfoSoc Directive. However, the Orphan Works Directive in recitals 2, 8 and 9 also emphasises the importance of free movements of knowledge, legal certainty in the internal market and the market’s functioning in general.
- 43 *Rosati*, op. cit. *supra* note 41, at pp. 1114 et seq.
- 44 See *Metzger*, op. cit. *supra* note 41, at p. 121; *Rosati*, Just a laughing matter? Why the decision in Deckmyn is broader than parody, CML Rev. 2015, 511, at pp. 520 et seq.
- 45 According to *von Lewinski* in: *Walter/von Lewinski* (eds.), European Copyright Law (2010), at 6.2.24, this was the reason why the Council amended the proposal for the Rental and Lending Directive to include the term “audiovisual works,” but leave “cinematographic works” in as well when defining “film” (see Art. 2 (1) (c)).
- 46 The transposed provisions in the German Copyright Act use the term “Filmwerke” (cinematographic works), “Tonträger” (phonograms) and, instead of audiovisual works, “Ton- und Bildträger” (audio and image media). The explanatory memorandum simply states that the directive intends to not only cover cinematographic works, but also its storage media, see *Deutscher Bundestag*, Drucks. 17/13423, at p. 15. While this may well be in accordance with the directive’s goals, the directive actually only uses the term “phonogram” which is not defined on a European level, but generally only refers to fixations of sound, see e.g. Art. 2 (b) of the WIPO Performances and Phonograms Treaty (WPPT).
- 47 CJEU, Case C-355/12 *Nintendo* [2014]
- 48 CJEU, Case C-355/12 *Nintendo* [2014], paragraphs 22 et seq.
- 49 *Rosati*, op. cit. *supra* note 41, at p. 1115. *Oehler* on the other hand interprets the decision to mean that the CJEU leaves this question open, see *Oehler*, EuGH: Umgehung des Schutzsystems für eine Videospielekonsole, MMR 2014, 401, at pp. 404 et seq. For a critical analysis of the CJEU’s understanding of the *lex specialis* doctrine, see *Rendas*, *Lex Specialis (sima): Videogames and Technological Protection Measures in EU Copyright Law*, E.I.P.R. 2015, 39, at pp. 43 et seq.
- 50 See CJEU, Case C-393/09 *BSA* [2010], paragraphs 40 et seq. The case did not concern video games, but the graphic user interface of computer programs. In this decision, the CJEU clearly distinguishes between the parts of a program that are protected under the Software Directive (the “expression in any form of a computer program which permits reproduction in different computer languages, “e.g. the source code and object code, paragraph 35), and the graphic user interface, which may be protected under the InfoSoc Directive, if it is original (paragraphs 44 et seq.). It thus appears possible that the court would also apply such a distributive approach to the different parts of video games.
- 51 For the issue of whether the presence of code may rule out a classification as an audiovisual or cinematographic work, see below, part A. II. (4).
- 52 *Leistner*, Der europäische Werkbegriff, ZGE 2013, 4, at p. 11; *Rosati*, op. cit. *supra* note 41, at pp. 1112 et seq.
- 53 *Schack*, Urheber- und Urhebervertragsrecht, at margin number 248; *Stamatoudi*, Are Sophisticated Multimedia Works Comparable to Video Games, 48 J. Copyright Soc’y U.S.A., 2001, 467, 470.
- 54 *Stamatoudi*, op. cit. *supra* note 53, at 470; *Schack* points out similar characteristics, op. cit. *supra* note 53, at 248.
- 55 Recital 10 of the InfoSoc Directive refers to „multimedia products”: “[...] The investment required to produce products such as *phonograms, films or multimedia products*, and services such as ‘on-demand’ services, is considerable. Adequate legal protection of intellectual property rights is necessary in order to guarantee the availability of such a reward and provide the opportunity for satisfactory returns on this investment.” (Emphasis added.) In the operative provisions however, only the term “film” is employed. While the wording of the recital may indicate that multimedia products and films are not the same thing, judging from this recital, the directive clearly intends to give legal protection to producers of films as well as multimedia products while nevertheless only using the term film in the operative part. This may thus also be considered as an indicator for an interpretation of the term film that also covers multimedia products.
- 56 Affirmative *Suthersanen/Frabboni* in: *Stamatoudi/Torremans* (eds.), EU Copyright Law (2014), at 13.13; critical of a broad definition of audiovisual works: *Kamina*, op. cit. *supra* note 22, at pp. 94 et seq.
- 57 See e.g. a recent decision by the German Federal Court (BGH), Urteil vom 27.11.2014 - I ZR 124/11 = BeckRS 2014, 22154, paragraph 40.
- 58 *Nordemann* in: *Fromm/Nordemann* (eds.), Urheberrecht, Vor §§ 88 ff. UrhG, at margin number 12.
- 59 *Ramos, et al.*, op. cit. *supra* note 19, at p. 8.
- 60 See *Stamatoudi*, op. cit. *supra* note 53, at pp. 479 et seq., with an overview of the case law in different states. See also, *Rendas*, op. cit. *supra* note 49, at p. 40.

- 61 Karl, Urheberrecht: Voraussetzungen der rechtmäßigen Umgehung eines Schutzsystems für Videospielekonsolen, *EuZW* 2014, 304, at p. 307.
- 62 Implied by e.g. *Manegold/Czernik*, in: Wandtke/Bullinger (eds.), *Praxiskommentar zum Urheberrecht* (2014), Vor §§ 88 UrhG, at margin number 72; However, *González*, *Der digitale Film im Urheberrecht* (2002), at p. 91 et seq., considers an animated film to be partly protected as a cinematographic work and partly as a computer program.
- 63 Once saved, it can be done by some form of digital player, see *González*, op. cit. *supra* note 62, at p. 73, who argues that therefore those kinds of animated movies that are only generated with the help of a computer program do not partly consist of computer programs.
- 64 *Ibid.*, at p. 68.
- 65 See Art. 1 Software Directive.
- 66 See *Suthersanen/Frabboni*, in: Stamatoudi & Torremans (eds.), *EU Copyright Law* (2014), at 13.13 who make an *ejusdem generis* argument.
- 67 See *Barwick, et al.*, op. cit. *supra* note 9, at p. 374.
- 68 A prominent example of this type of game is *Second Life*.
- 69 See also, *Dreier* in: Walter/von Lewinski (eds.), *European Copyright Law* (2010), at 7.3.12.
- 70 For a more detailed comparison see *Rauda*, *Recht der Computerspiele*, at p. 39. The German Copyright Act, in Art. 2 (1) Nr. 6 also speaks of “cinematographic works, including works produced by processes similar to cinematography”.
- 71 *Lenaerts/Gutiérrez-Fons*, *To Say What the Law of the EU Is*, *EUI Working Papers AEL* 2013/9, at p. 14, *Riesenhuber*, in: *Europäische Methodenlehre*, op. cit. *supra* note 24, at § 10 margin number 24.
- 72 However, e.g. the term “film” in the Rental and Lending Directive has always been considered broader than what the rental and lending of films would usually require and this does not appear to have caused any problems, see *von Lewinski*, in: *Walter/von Lewinski* (eds.), *European Copyright Law* (2010), at 6.2.26.
- 73 With regard to the principal director, Art. 2 (1) Term Directive and Art. 2 (2) Rental and Lending Directive already state that he or she shall be considered one of the film’s authors.
- 74 For Germany, see §§ 88, 89 German Copyright Act (UrhG).
- 75 See e.g. § 93 German Copyright Act (UrhG).
- 76 See *Kamina*, op. cit. *supra* note 22, at p. 94 with examples from France.
- 77 For Germany, see e.g. *BayObLG*, *GRUR* 1992, 508. A detailed analysis of the consequences a classification of games as audiovisual or cinematographic works would have in different Member States is, however, outside the scope of this article.
- 78 *nestor* (ed.): *Fact Sheet 22, Emulation als Bewahrungskonzept in: Langzeiterhaltung digitaler Daten in Museen*, available at: http://files.dnb.de/nesstor/sheets/22_emulation.pdf; *van der Hoeven/van Wijngaarden* note: “Digital objects are increasingly dependent on functionality, so ignoring the environmental aspects disables the possibility of full reconstruction of the objects”, *Modular emulation as a long-term preservation strategy for digital objects*, available at: <http://iwaw.europarchive.org/05/papers/iwaw05-hoeven.pdf>.
- 79 *Wen*, *Why emulators make video-game makers quake*, June 4, 1999, available at: <http://www.salon.com/1999/06/04/emulators/>. However, not all emulators necessarily emulate hardware as explained below.
- 80 *Rothenberg*, *Avoiding Technological Quicksand: Finding a Viable Technical Foundation for Digital Preservation – A Report to the Council on Library and Information Resources*, 1999, at p. 17, available at: <http://www.clir.org/pubs/reports/rothenberg/pub77.pdf>.
- 81 *nestor* (ed.): *Fact Sheet 22, Emulation als Bewahrungskonzept in: Langzeiterhaltung digitaler Daten in Museen*, available at: http://files.dnb.de/nesstor/sheets/22_emulation.pdf.
- 82 This is considered the most adequate form of emulation, see *Loebel*, op. cit. *supra* note 1, at pp. 63 et seq. with further references.
- 83 *Tsiricos*, *One Flew Over Pac-Man’s Nest*, October 1, 2000, available at: <http://pdf.textfiles.com/academics/pacman-tsiricos.pdf>, at p. 20.
- 84 *van der Hoeven et al.*, op. cit. *supra* note 3, at 4.2.
- 85 *Ibid.*
- 86 *Ibid.*
- 87 *Ibid.*, at 7.
- 88 *Ibid.*, at 4.1.
- 89 See *Stieper*, *Rechtfertigung, Rechtsnatur und Disponibilität der Schranken des Urheberrechts* (2009), at p. 475.
- 90 See §§ 53, 95 (b) German Copyright Act (UrhG), *Arlt*, in: *Hoeren/Sieber/Holzengel* (eds.), *Multimedia-Recht* (2014), at margin numbers 54 et seq.
- 91 CJEU, Case C-355/12 *Nintendo* [2014], paragraph 25. *Jütte* interprets the decisions to mean that users may in fact circumvent technical protection measures for non-infringing uses, see *Jütte*, *Technische Schutzmaßnahmen an der Schnittstelle der Interessen von Rechtsinhabern und Nutzern*, in: *Taeter* (ed.), *Big Data & Co*, *DSRI Tagungsband Herbstakademie* (2014), 237, at pp. 248 et seq.
- 92 *Id.*, paragraph 36.
- 93 *Id.*
- 94 *van der Hoeven, et al.*, op. cit. *supra* note 3, at 6.2.
- 95 See *Barwick, et al.*, op. cit. *supra* note 9, at p. 385.
- 96 *van der Hoeven, et al.*, op. cit. *supra* note 3, at 6.2.; *Ricolfi, et al.*, *Survey of Private Copyright Documentation Systems and Practices* (prepared for WIPO) (2011), available at: http://www.wipo.int/export/sites/www/meetings/en/2011/wipo_cr_doc_ge_11/pdf/survey_private_crdocsystems.pdf, at p. 11.
- 97 *van der Hoeven, et al.*, op. cit. *supra* note 3, at 2.
- 98 *Loebel*, op. cit. *supra* note 1, pp. 107, 160.
- 99 CJEU, Case C-419/13 *Art & Allposters* [2014], paragraphs 27, 46. The court also left open the interpretation of Art. 12 Berne Convention, which provides: ‘Authors of literary or artistic works shall enjoy the exclusive right of authorising adaptations, arrangements and other alterations of their works.’ On the relationship between the right of reproduction and the right of adaptation, see *Cabay/Lambrecht*, *Remix prohibited: how rigid EU copyright laws inhibit creativity*, *Journal of Intellectual Property Law & Practice*, 2015, Vol. 10, No. 5, 359, at pp. 362 et seq.
- 100 Whether the Software Directive would be relevant with regard to video games is disputed (even though this issue would only affect alterations of the code of the game). For the diverging opinions on the applicability of the different directives, see *supra* part A. II. 2. and notes 49 and 50.
- 101 European projects that dealt with emulation as a preservation strategy were not limited to video games, see e.g. *KEEP* (“Keeping Emulation Environments Portable”, a project aimed at enabling the “accurate rendering of both static and dynamic digital objects”, see *About Keep*, available at: <http://www.keepproject.eu/ezpub2/index.php?/eng/About-KEEP>), or *PLANETS* (“Preservation and Long-term Access through Networked Services”), see the project page, available at: <http://www.planets-project.eu/>.
- 102 There is a long list of games that were rereleased as freeware, see *List of commercial video games released*

as freeware, available at: https://en.wikipedia.org/wiki/List_of_commercial_video_games_released_as_freeware.

- 103 An example is SimCity (1998), which was rereleased under a GNU GPLv3 under the (original) title Micropolis in 2008, see *Simser*, SimCity Source Code Released to the Wild!, January 10, 2008, available at: <http://weblogs.asp.net/bsimser/simcity-source-code-released-to-the-wild-let-the-ports-begin>. There are many more examples, see List of commercial video games with available source code, available at: https://en.wikipedia.org/wiki/List_of_commercial_video_games_with_available_source_code
- 104 See FSF, What is free software, available at: <http://www.fsf.org/about/what-is-free-software>. For a detailed analysis of the General Public Licence, see *Dusollier*, Open source and copyleft: authorship reconsidered?, 26 Colum. J.L. & Arts 281 (2003), at p. 284 et seq. Available at: http://works.bepress.com/severine_dusollier/18/.
- 105 As there are a plurality of alternative licences, other issues (such as the compatibility between different licences and questions of private international law) may arise that are outside the scope of this article. For details, see *Metzger*, Open Source und andere alternative Lizenzmodelle. Nutzung des Urheberrechts als Mittel zur Sicherung freier Kommunikation, in: Grünberger/Leible (eds.), Die Kollision von Urheberrecht und Nutzerverhalten (2014), 115, at p. 121 et seq.
- 106 *Dusollier*, Sharing access to intellectual property through private ordering, 82 *Chicago-Kent Law Review* 1391 (2007), at p. 1414. Available at: http://works.bepress.com/severine_dusollier/14
- 107 For a detailed analysis of the general questions around the conclusion of contracts and open software licenses see *Metzger*, Freie Software, Open Content – Ausgleich expansiver Urheberrechte durch das Vertragsrecht? in Hilty/Peukert (eds.), Interessenausgleich im Urheberrecht, (2004), 253, at p. 254 et seq.
- 108 See e.g. *Moore*, Lost in limbo: on the hunt for PC gaming's abandoned classics, Mar 27, 2015, available at: <http://www.pcgamer.com/lost-in-limbo-on-the-hunt-for-pc-gamings-abandoned-classics/>; *Savetz*, Can „Abandonware“ Revive Forgotten Programs? – Challenges and Obstacles, September 17, 2001, available at: <http://web.archive.org/web/20120213191159/http://www.savetz.com/articles/byte-abandonware.php?sort=date>.