

---

This item was submitted to [Loughborough's Research Repository](#) by the author.  
Items in Figshare are protected by copyright, with all rights reserved, unless otherwise indicated.

## **Playing games with cultural heritage: a comparative case study analysis of the current status of digital game preservation**

PLEASE CITE THE PUBLISHED VERSION

<http://dx.doi.org/10.1177/1555412010391092>

PUBLISHER

© SAGE Publications

VERSION

AM (Accepted Manuscript)

LICENCE

CC BY-NC-ND 4.0

REPOSITORY RECORD

Barwick, Joanna, James A. Dearnley, and Adrienne Muir. 2019. "Playing Games with Cultural Heritage: A Comparative Case Study Analysis of the Current Status of Digital Game Preservation". figshare. <https://hdl.handle.net/2134/8795>.

This item was submitted to Loughborough's Institutional Repository (<https://dspace.lboro.ac.uk/>) by the author and is made available under the following Creative Commons Licence conditions.



CC creative commons  
COMMONS DEED

**Attribution-NonCommercial-NoDerivs 2.5**

**You are free:**

- to copy, distribute, display, and perform the work

**Under the following conditions:**

 **Attribution.** You must attribute the work in the manner specified by the author or licensor.

 **Noncommercial.** You may not use this work for commercial purposes.

 **No Derivative Works.** You may not alter, transform, or build upon this work.

- For any reuse or distribution, you must make clear to others the license terms of this work.
- Any of these conditions can be waived if you get permission from the copyright holder.

**Your fair use and other rights are in no way affected by the above.**

This is a human-readable summary of the [Legal Code \(the full license\)](#).

[Disclaimer](#) 

For the full text of this licence, please go to:  
<http://creativecommons.org/licenses/by-nc-nd/2.5/>

## **Playing games with cultural heritage**

### **A comparative case study analysis of the current status of digital game preservation**

#### **Abstract**

Digital games are major part of popular culture. They are also an important part of the history of play and as such they deserve to take their rightful place in our cultural legacy. However, they have received little attention in the academic literature on preservation. Despite this lack of interest, some institutions have recognised the significance of preventing the loss of these valuable materials but to what extent is their longevity ensured? What is the current status of game preservation? What are the challenges facing institutions as they ‘play games with cultural heritage’? This paper provides an overview of the current state of play and, using a comparative case study analysis, provides an insight into the issues, which lie ahead.

**Keywords:** case study, games, preservation, heritage, culture

## **Playing games with cultural heritage**

### **A comparative case study analysis of the current status of digital game preservation**

The study of games has had distinct periods of intensity and has received interest from a wide range of academic disciplines. Early games theorists, such as Huizinga, Caillois and Sutton-Smith, were interested in what games can tell us about our society. Huizinga refers to play as “a cultural phenomenon” (Huizinga 1938, p.18) and Caillois suggests that “the destinies of cultures can be read in their games” (Caillois 1962, p.35). In recent years, in a period defined as the “third wave of game studies” (Juul 2001, p.4), there has been a growing academic interest in the study of digital games for similar reasons. Games researchers, such as Aarseth, view digital games as “the most fascinating cultural material to appear in a very long time” (Aarseth 2001). Kucklich affirms that digital games are “cultural products with deep roots in the culture they stem from” (Kucklich 2006, p. 104). In other words, digital games are a “living mirror of any given society” (Massonet in Lauwaert et al 2007, p.91).

This renewed academic interest in games raises questions about preservation. In order to support sustainable research in the field of digital games, it is important that researchers have access to primary resources (Barwick et al, 2009). This can only be achieved through recognition of the cultural significance of digital games and action by institutions to protect and preserve the history of games. A white paper, “Before it’s too late”, produced by the IGDA Preservation Special Interest Group<sup>1</sup>, has addressed the significance of digital games and the issues of why we should preserve them. Recent projects, such as the Library of Congress funded ‘Preserving Virtual Worlds’<sup>2</sup> project and the

---

<sup>1</sup> The white paper was previously published in the *American Journal of Play* 2(2).

<sup>2</sup> The official website of this project is available at: <http://pvw.illinois.edu/pvw/>

KEEP project<sup>3</sup>, are focussing on the practical issues of game preservation. However, it is also important to undertake a thorough examination of what is already happening and what remains to be done. This provides a clearer view of the present situation. It enables further understanding of the extent of the problems and it can give a focus to the efforts to find solutions. Before this is possible, it is necessary to understand the key concepts of digital game and preservation.

Digital games are, first and foremost, games and as such have strong links to traditional non-digital games. For ludologists, such as Aarseth and Eskelinen, digital games are complex systems in which the components of rules and strategies are paramount and the main emphasis is on player interaction:

“Games are both object and process; they can’t be read as texts or listened to as music, they must be played.” (Aarseth 2001)

Immersion and interaction are key features of digital games and in order to fully appreciate them, it is necessary to understand that they are designed to be played. These issues will be equally important when considering the preservation of digital games.

Preservation is defined by Deegan and Tanner as:

“the continuous process of creating and maintaining the best environment possible for the storage and/or use of an artifact to prevent damage or degradation and to enable it to live as long a lifetime as possible.” (Deegan and Tanner 2006, p. 3)

These processes are necessary because “culture is at constant risk” (Deegan and Tanner (2006, p. 4). Without positive action, and the ‘continuous processes’ of preservation, important information and resources are damaged, destroyed or lost and it is seen as the

---

<sup>3</sup> The KEEP project website is available at: <http://www.keep-project.eu/ezpub2/index.php>

responsibility of institutions, such as museums and libraries, to safeguard against these losses. There is a useful example of why this positive action is necessary from the history of television. Many early television and radio programmes were lost because no preservation policies in place; however, since 1981, the UK's Independent Broadcasting Authority has made preservation a compulsory clause in its contracts with companies (Deegan and Tanner 2003). This change in policy reflected a wider acceptance of television as an important part of media history and a valuable aspect of popular culture. This case highlights the complexity of preservation decisions. It also raises the question of how digital games fit into current preservation strategies.

In this article, the current status of digital game preservation will be reviewed. This will comprise of an overview of current preservation activities and initiatives, leading into an introduction to specific case studies of digital game preservation. These include the Strong National Museum in Rochester, US; the Computerspiele Museum in Berlin and the National Videogame Archive at the National Media Museum in UK. Through these case studies, it is possible to identify various obstacles which are affecting the future security of digital games and certain common challenges which need to be addressed in order to ensure the sustainability of preservation efforts.

#### **Current status of game preservation: online activities**

Cortada states that “the first group of individuals to recognise a new subject area consists usually of participants followed closely after by students of the field and finally, if belatedly, by librarians and archivists” (Cortada in Lowood 2004, p.11). However, it is the gaming enthusiasts who have been one of the first groups to identify the significance of preserving the history of digital games. Having formed online preservation groups, the gaming community have been the most prolific activists in this area. Motivated by nostalgia,

these groups, run by part-time enthusiasts, have an awareness of what is being lost due to the lack of interest from official preservation organisations. Kvamme, of the group *C64tapes*, states:

“The industry failed to do this important job and the government and museums also failed to see the importance of doing this. We simply stepped up to do the work before it's too late.... If we don't, who will?” (Kvamme 2009)

Certainly, the work of these groups represents some of the most comprehensive efforts to ensure long-term access to these games. They have dedicated considerable time to this goal and they have become technical experts in working with advanced digital preservation methods, such as emulation. For these reasons, it is probable that “at least 50% of game preservation will be done at the fan-level” (Pinchbeck 2009).

Despite these significant efforts, these groups are faced with a serious challenge. The majority of their preservation work is being undertaken without direct permission from the appropriate rights holders and therefore, the legality of their activities is a “somewhat grey area” (Kvamme 2009). Consequently, they are not a stable preservation solution and they cannot be viewed as a legitimate research resource. Pinchbeck observes:

“It is not acceptable for professional researchers to be downloading illegal media.”  
(Pinchbeck 2009)

This does not mean that their work is without value. Lowood acknowledges a potential symbiotic relationship between heritage institutions and these enthusiasts:

“I think of the cultural institutions as like big battleships and the individual enthusiasts are like PT boats. The PT boats can get around much quicker but it is much more difficult to steer a battleship in a new direction. However, the PT boats/enthusiasts are more vulnerable to attack and destruction whereas the battleships

are more resilient. Cultural institutions have more experience of long-term preservation strategies.” (Lowood 2009)

The knowledge and expertise that these groups have acquired will be an important aspect of the development of official preservation policies and, in an ideal world, these groups would be working together with institutions for a common goal of sustainable game preservation.

### **Current status of game preservation: research institutions**

The growth of academic interest in digital games has prompted some response from research institutions in relation to preservation. The Stephen M. Cabrinety collection at Stanford University is one of the most notable examples, as the “first archival and library collection of digital games in the US” (DiGA). This collection contains “software, computer hardware, peripheral devices, hand-held games, and computer industry literature documenting the micro computing gaming industry during its formative years [between 1975-1993]” (OAC). Held in the University’s History of Microcomputing Library, it includes over 6000 pieces of software, 400 items of hardware and nearly 20 linear feet of printed materials (Stanford University Library). Other American institutions have also started digital game collections, for example, the Centre for American History at the University of Texas and the University of Illinois. These collections are seen as valuable research support tools. A librarian at the University of Illinois, comments:

“Cultural preservation is significant in that video games are a cultural production of contemporary society. One of the important things that libraries do is collect the intellectual output of not only scholars, but our culture as a whole. We think it’s important to capture these and to preserve them because people want to use them now and probably analyse them in 30 years.” (Cheung, 2007)

Outside of the United States, other institutions have also seen the significance of preserving these artefacts. In Japan, Professor Hosoi Koichi of Ritsumeikan University started the Game Archive Project in 1998 to create an archive of “the entire gaming experience” (Ritsumeikan University, 2006). This project involves collecting computer hardware and software; developing emulators and making visual recordings of gaming experiences. This archive is intended to support the work of future generations of researchers.

These institutional examples of digital game preservation are exceptional. Very few institutions that teach and research digital games have similar collections, or the resources to develop them. Researchers often have to rely on personal collections, or experience, as Liz Evans, a games researcher at Nottingham University, admits:

“As a researcher it is very frustrating because there is not any digital archive.... I have pictures of all the games so I know exactly what they look like but I can’t play them. The only way I have about talking about playing them is from my memory. And it is very frustrating. You kind of learn to at least get a screenshot of anything interesting when you discover it, just in case it’s gone again.” (Evans 2008)

These experiences are common because the content of digital media is intangible; if it is not captured and secured for future generations, it can easily disappear:

“With traditional collections, lack of selection for preservation may not necessarily mean that the item will be lost, allowing for a comfort zone...no such comfort zone exists in the digital environment where non-selection...will almost certainly mean loss of the item, even if it is subsequently considered worthwhile.” (Jones and Beagrie 2001)

The development of historical collections would be the solution but to what extent are the traditional heritage institutions aware that a problem exists?

### **Current status of game preservation: heritage institutions**

Heritage institutions have traditionally been responsible for the preservation and protection of our cultural heritage but, as Jones and Beagrie observe:

“The question of who should be responsible for ensuring long-term preservation is by no mean as established in the digital environment as it is in the analogue environment.” (Jones and Beagrie 2001)

The main problem is that ‘born-digital’ materials, such as digital games, do not fit comfortably into the traditional collection strategies of these institutions. With the development of computer technology and the Internet, there are a large number of materials which have a difficult relationship with the preservation strategies of the traditional institutions. Owen refers to this as the ‘heterogeneous’ characteristic of digital materials and states:

“Modern society is characterised by a multitude of digital forms that far exceeds what is preserved in the majority of our heritage institutions, even when they make the shift to digital materials.” (Owen 2007, p. 47)

Digital preservation strategies have focussed on preserving existing collections. In other words, the novelty of some of these digital forms, which includes material such as ‘blogs, social networking sites, as well as digital games, exacerbates the risk of loss because current institutional preservation policies are not designed to include them. However, the importance of the involvement of heritage institutions is clear, as Jones and Semple comment:

“The professional expertise of archivists and librarians in selecting and organising material for preservation is still valuable.” (Jones and Semple 2006)

Duncan Best, Events Manager for Entertainment and Leisure Software Protection Agency (ELSPA), also sees the involvement of heritage institutions as key to their success:

“If you are talking about take-up and scepticism about projects, which is always 99% of the problem with new projects is getting people to buy into it, you need a well-established organisation...their involvement is essential” (Best 2008)

The preservation of digital games has received some attention from heritage institutions and the complexity of the discipline of games studies is reflected in the different preservation environments. Digital games fit into a number of different contexts. They are an important aspect of the development of computer technologies, as well as a new branch of the medium of the moving image. In relation to this, institutions such as the Computer History Museum in Mountain View, CA and the American Museum of Moving Image in N.Y have collections of digital games as part of their wider collection. They are also part of the history of play and one of the most significant museum collections is at the Strong National Museum of Play, which has recently launched the National Center for the History of Electronic Games.

Within these contexts, digital games are only a small chapter in a bigger story: examples of institutions recognising games as unique aspects of culture in their own right are rare. In Berlin, a museum dedicated to digital games was opened in 1997: the Computerspiele Museum was “the first permanent exhibition of digital interactive entertainment culture” (Computerspiele Museum). Unfortunately, the museum closed in 2000 and there are still no clear signs that the permanent collection will re-open. In 2008, the National Videogame Archive was launched by the National Media Museum in Bradford, UK. The aim of this

initiative is “to collect, interpret, make accessible for study and research and, where possible, exhibit videogames and the associated ephemera relating to or evidencing videogame cultures” (NVA 2008). These significant examples of digital game preservation are a useful basis for a case study analysis of the current issues and problems.

## **Introduction to the case studies**

A case study is an effective method for gaining an understanding of the current status of a certain phenomenon - in this case, the status of digital game preservation. It allows for “a detailed and intensive analysis” (Bryman 2004, p. 537) and when carried out in combination with other case studies, this can be useful for comparative purposes. The case studies identified for the purposes of this investigation into the current status of digital game preservation are the Strong National Museum of Play in the USA, the National Videogame Archive in UK, and the Computerspiele Museum in Germany. These cases provide a useful international perspective on issues surrounding game preservation. Although the contexts of these collections are different in many ways, a comparative analysis reveals that they share many issues in common.

- **Computerspiele Museum**

The Computerspiele Museum in Berlin was the “the first permanent exhibition of digital interactive entertainment culture” (Computerspiele Museum). Its mission statement aimed “to increase the acceptance of the media and remove existing prejudices” (Computerspiele Museum). Its founder, Andreas Lange, is one of the key figures in digital game preservation and, despite the museum’s closure in 2000, he remains an active supporter of game preservation initiatives via the *Digital Games Archive* (DiGA) website. The museum’s collections are currently in storage but they are still accessible to researchers.

There is some optimism that the museum will eventually re-open. Lange hopes that with governmental moves to promote the growth of the creative industries in Berlin, the museum will be recognised as a significant part of cultural heritage:

“The museum will be a sign that Berlin is an innovative place, which welcomes the creative industries and game developers.” (Lange 2009)

- **Strong National Museum of Play**

The Strong National Museum of Play, in Rochester, US, is the “only museum in the world dedicated solely to the study of play as it illuminates American culture” (Strong National Museum). The museum collects and preserves artefacts relating to the history of play. Founded in 1968, it has a collection of over half a million toys, dolls and other objects of play and is the custodian of the ‘National Toy Hall of Fame’. The Museum has recognised that digital games are an important development in the history of play, and recently started to “aggressively collect” electronic games. Launching the National Center for the History of Electronic Games, Jon-Paul Dyson, who is conscious of the close relationship between digital games and traditional toys and games, stated:

“We... feel that there is a lot of continuity - games are revolutionary but there is a lot of continuity between play and games, pre-electronic games and play and electronic games and play. We want to explain that continuity...so what are the parallel differences between playing Tennis and *Wii Tennis* or with constructive play, between using blocks and playing Spielberg’s blocks on Wii. Or playing Cowboys and Indians in your backyard to playing *Halo*.” (Dyson 2009)

- **The National Videogame Archive**

During 2006, the UK’s National Museum of Photography, Film and Television was re-branded as the National Media Museum. At this time, the museum began to consider “the

things we were not really covering before, things we did not really have a voice about, things like the Internet and the history of computing, the history of computer games and mobile technology” (Woolley 2008). For the National Media Museum, digital games were seen as having an important relationship with other media, in particular because of their status as a new media form. Tom Woolley, curator of New Media, remarked:

“The games collection - the games archive - that was just an automatic response to what new media is. Games are a huge part of that, falling out of the computing revolution.” (Woolley 2008)

For these reasons, digital games are seen to be important parts of the museum’s remit and in 2008, the National Videogame Archive (NVA) was launched as a joint project between the National Media Museum and Nottingham Trent University.

### **The challenges and obstacles of digital game preservation**

Interviews were conducted with representatives from these institutions. This included Tom Woolley, Curator of New Media at the National Media Museum; James Newman and Iain Simons, academic partners in the National Videogame Archive project; Andreas Lange, Curator of the Computerspiele Museum and Jon-Paul Dyson, Director of the National Centre for the History of Electronic Games. Through these interviews, it became apparent that there are various challenges and obstacles involved in the preservation of digital games. These have been highlighted as the problems of long-term preservation, including legal issues; the issues of exhibition and interpretation of these objects; and the selection of material for collections.

- **Long-term preservation**

All acts of preservation require specialist methods and techniques. For digital preservation, these methods are not as well established and technical issues present one of the

major challenges for the institutions and organisations that have responsibility for preserving digital heritage. Currently, there are three main approaches to digital preservation: technological preservation; migration and emulation. In relation to digital games, current practices are focussing on the collection of hardware and software, a typical museum approach of ‘technological preservation’. However, as an aspect of digital media, digital games are dynamic. Unlike traditional materials, they are designed to be interactive; in other words, they are designed to be played. Sid Meier describes games as “a series of interesting choices” (Meier in Juul, *Half-Real: A dictionary of video game theory*). Kucklich suggests that this means that “there is no fixed meaning but a range of meaning depending on the way the game is played” (Kucklich in Rutter and Bryce 2006, p. 104). Certainly, seeing games as activities raises complex questions about how to preserve them. Capturing these experiences is an important component of their preservation and it is about more than saving the original objects:

“Heritage preservation...implies not just storage and maintenance of digital artefacts, but the capturing of dynamic processes and patterns of use.” (Owen 2007, p. 48)

Technological preservation is not considered a viable solution to the problems of digital preservation. In most cases, the hardware and software as objects have very little relevance to the game as an activity. Furthermore, if the original hardware or software fail, it will eventually become impossible to replace and this would render the games to lifeless pieces of plastic. This is not a satisfactory outcome, as Jamie Sefton, from Game Republic, observes:

“Preserving a 20 year old box behind glass is not what it is about. It is about keeping this software alive so people can still play it.” (Sefton 2009)

So what are the alternatives and are museums prepared to embrace them?

Emulation is “the heart of software preservation” (DiGA). It involves the development of “programmes that translate code and instructions from one computing environment so it can be properly executed in another” (Cornell University 2007). In other words, emulation is used to recreate the actions of the original hardware in an accessible form. Emulators have been widely used by the gaming community to translate digital game software for use on other types of hardware but traditional institutions are struggling to deal with the complex techniques of digital preservation. Woolley acknowledges that “it is a massive task... ..overwhelming” (Woolley 2008). Dyson recognises the significance of emulation but he admits that the Strong National Museum has not yet started to address the issues:

“In preserving the games, I cannot say that we have been very active in leading any efforts in emulation - this is due to resources at the moment so it does not mean that we will not do it in the future.” (Dyson 2009)

In addition the complexity of the task itself, there are legal issues ahead for museums as they start to investigate the digital preservation of games. The industry’s reaction to the development of physical collections has been positive, but as Dyson observes, “emulation is a whole other issue and there are all sorts of issues that come up with that” (Dyson 2009). Lavoie and Dempsey are conscious of the fact that “digital preservation is perceived as a threat to Intellectual Property Rights” (2004). Cultural industries, such as the digital games industry, have a history of being extremely protective of these rights, and this has been experienced first-hand by some online preservation enthusiasts (Leonard 2009). Simons recognises this as a potential barrier for collections and he suggests that “there will be a big legal fight to come” (Simons 2008). Certainly, the legal issues involved imply that there is a

need for the participation of the industry. The alternative is a change in IP laws which will guarantee museums can maintain future access to these materials:

“What we need is an official exception for electronic media and games which states that after so many years it is ok to distribute this stuff...the law is preventing the archiving of history.” (Leonard 2009)

The uncertainty of institutions about these issues is a potential threat to the long-term security of their collections.

- **Exhibiting and interpreting digital games**

Digital games are more than a combination of hardware and software because games are both objects and activities, as Salen and Zimmerman state:

“The physical medium of the computer is one element that makes up the system of the game, but it does not represent the entire game. The computer hardware and software are merely the materials of which the game are composed.” (Salen and Zimmerman 2003, p. 86)

This is echoed by Juul, with his observation that “game can mean two things: a static object or artefact or event that players perform” (Juul 2005, p. 43). They also have a complex structure and, as Lavoie and Dempsey (2004) observe, they can “subsume multiple formats, being at once text, images, animations, sound and video” and in addition, “they are often not static objects that can be stored ‘as-is’ but...change over time” (Owen 2007, p. 48). The dynamic characteristic of digital games raises complex issues and new challenges for the institutions involved. How can games be exhibited and displayed to a museum audience? How can the activity of the game be preserved?

As Lowood states, “game preservation is more than just software preservation” (Lowood 2009). If games are activities, they are also experiences and the use of emulation as

a preservation technique raises questions about the authenticity of experience. Newman observes:

“If you are going play a game, I think you have to play with the original.... we tend to think that emulation is an exact copy - but it isn't. It is very much about the integrity of the experience - so it's really useful and interesting but it is not the same experience.” (Newman 2009)

Dyson is also aware that there are issues with emulation but he recognises that the ‘integrity of experience’ is difficult to achieve:

“The ultimate problem comes with how do you give guests an authentic experience.... We want to create as authentic an experience as possible but sometimes, it is not always possible.” (Dyson [M])

However, these comments overlook that an authentic experience is impossible to achieve. Players who approach games from a different context will experience the games differently. In 50 years time, these games will not be experienced in the same way that a player experiences them today: their context will be completely different. This demonstrates that the museums have a lot of unanswered questions in relation to the best way forward for their collections.

In order to exhibit games, the foci of the museums' collections are “the stories of games” (Lowood 2009) or the cultural context of the games. Avedon and Sutton-Smith suggest that “the meaning of games is...a function of the ideas of those who think about them” (Avedon and Sutton-Smith 1971, p.438), and different museums have their own ways of interpreting games. The Computerspiele Museum is interested in demonstrating that “computer games are more than just toys” (Lange 2009). For the National Media Museum, digital games are an aspect of new media and they are interested in “how the community has consumed it” (Woolley 2008). For the Strong National Museum, digital games are a new

development in the history of play and their interest is in games “as being part of a larger aspect of play and human culture” (Dyson 2009).

Despite these differences of interpretation, there are commonalities which link the relationship of playing the game to the rest of the world (Juul 2005, p. 28). Woolley suggests that “the way it has impacted society is the primary way which we will be examining the history of games” (Woolley 2008). Dyson expands on this idea:

[We are interested in]...their impact on human culture and the big issues that surround games so how they affect social relations or how they affect learning; questions of addiction and violence in games. So the big questions that surround the videogames themselves.” (Dyson 2009)

In order to achieve these objectives, the museums have to consider the practicalities of how to present games to a museum audience. In their work, *Rules of Play*, Salen and Zimmerman present a useful model for understanding this. They explain that “culturally speaking the technological facet...is merely one element among many others” and they suggest that in order to fully understand a game’s cultural significance, it is also necessary to look at other elements such as “game fan magazines..., the marketing, the manufacturing..., the demographics of players, and so on” (Salen and Zimmerman 2003, p. 86). Fortunately, these institutions are aware that building collections of digital games will include accumulating items other than just the hardware and software, as Newman observes:

“...it is tempting to just save the game - that is the object. But our reasoning is that the game is not the finite way to explain the object.” (Newman 2009)

Dyson also acknowledges that their collection will extend beyond the games as objects and Simons recognises that the objects will need to be displayed in relation to other aspects of its cultural context:

“The concern is how do we translate and codify the cultural importance of videogames and how do we explain what videogames are to someone who has not seen them before and in all likelihood, the thing that does that best is not the videogame.” (Simons 2008)

Therefore, the collections will include, alongside the hardware and software, “indirect means [of interpretation]– whether it be oral histories...or paper game guides” (Dyson 2009) or, in other words, “the ephemera which surrounds games” (Simons 2008). This approach is intended to present a fuller appreciation of game culture and aims to overcome the problem that the games alone are “really bad at telling their stories” (Newman 2009).

- **Selection**

Making predictions about what will be significant in the future is a difficult task because, as Leonard observes, “it is very difficult to know if something is historically relevant until we need it” (Leonard 2009). However, the funding implications and costs of preservation activities mean that active decisions have to be made about what should be preserved. This is acknowledged by Dyson and Newman:

“Because every game you take in takes time to process...you have to decide what is this the best use of our time.” (Dyson 2009)

“It is not the museum of everything...I think you have to make decisions.” (Newman 2009)

In the digital environment, the selection of material for preservation has become a more complex process. This is due to the lack of a ‘comfort zone’ to allow retrospective collecting. So, how are these institutions making decisions about which material to select for preservation?

The commitment necessary to ensure the longevity of preserved material is restrictive. Not everything can be preserved, and therefore, museums rely upon strategic selection and retention policies. The National Videogame Archive is creating a collections policy to guide these decisions (Woolley 2008). The Strong National Museum has developed a framework for collecting, interpreting and exhibiting electronic games (Dyson 2009). Many of the decision processes outlined in these documents are very similar. Newman states that the National Videogame Archive has “a clear sense of what games are important in the early stages” (Newman 2009). Woolley suggests that the archive will focus on “landmark software” (Woolley 2008). Dyson sees the focus of the Strong National Museum’s collection as “popular games...pioneer games...games with a wider social impact” (Dyson 2009). The people involved in the selection process will greatly influence how these judgments are made. In order to overcome the problem that this is based on the value judgments of a limited group, the National Videogame Archive hopes to involve the gaming community:

“The board for the NVA is the people you would expect from the UK perspective and they are identifying the culturally significant and interesting titles that might be collected. But we are also hoping to work with the community as cultural significance is of course quite subjective.” (Simons 2008)

However, even with the best intentions, Dyson admits that museum collections are often dependent on donations. This means that “there is always a serendipitous quality to what museums own” (Dyson 2009).

Some critics have suggested that a selective approach to the preservation of digital games is not a viable solution. Duncan Best, Director of the London Games Festival, argues:

“To take an approach whereby people in their own time are making judgements about whether that is significant or not, is a poor, poor solution to this problem and it has

been proved time and time again that this is a really bad way of doing this. It is an absolutely ignorant way of moving forward on something like this.” (Best 2008)

Best’s alternative approach would be a legal deposit type arrangement whereby one copy of every newly produced game was retained for preservation. In France, the national library has adopted a legal deposit scheme for digital games but as yet, digital games are widely excluded from preservation programmes in Germany and UK. Lange comments:

“There is a move towards digital preservation [by the national library] but games are excluded from that and there is no one in government questioning this exclusion.” (Lange 2009)

There is certainly no indication that there are any moves towards this as a solution. There is no institution with specific responsibility for digital games and a desire to take this on. The Strong National Museum, which has similar systems set up with the toy industry, is open to the possibility of a selective form of deposit. Newman rejects this as a possible direction for the National Videogame Archive:

“We are taking the view that this stuff is in peril so it is necessary to do something. I think in principle, a British Library style approach [legal deposit], is not a bad thing at all. But we have given ourselves a particular job to do and that is not part of our immediate plan to move towards. I am not sure that even in the longer term that would be an objective.” (Newman 2009)

These disagreements over selection demonstrate that there are still debates to be had about the future preservation of digital game heritage.

- **Summary**

Digital game preservation raises complex issues and new challenges for heritage institutions. These case studies have emphasised the main issues of concern as the exhibition

and interpretation of games, long-term preservation methods and the question of selection. However, it is clear that there are wider issues of concern. At present, the focus of the museums is how they can best display and explain digital games to the widest potential audience but is this, the only responsibility of a museum? Due to a lack of resources and experience of digital preservation, little attention has been paid to the methods of ensuring the longevity of these collections. The issue of the authenticity of an emulated experience and the legal issues involved provide further challenges for museums. A selective approach is being taken. In order to make the right decisions, the museums have created specific policies which will guide the development of their collections. There is no intention for the museums to be ‘the museum of everything’ and there have been no national efforts to encourage legal deposit schemes.

## **Conclusions**

It is evident that there is a growing recognition of the historical and cultural significance of computer games, and this is reflected in the activities of four institutions interviewed as part of this paper. There are, however, many questions that remain unanswered in relation to the long-term security of this aspect of our digital heritage.

The primary focus of the institutions interviewed in this paper is how games can be exhibited to a museum audience, and act as a resource for future generations of researchers. The solution will certainly lie in hybrid collections which bring together physical collections and digital collections, including oral histories and documentation on the experience of playing these games, as well as related artefacts. This will allow the context of the games to be better understood. However, if these museums want to prolong the life of their exhibitions and collections, an obvious – but glib – suggestion might be that they need to take “serious

steps” towards digital preservation. But, it is apparent from this research that the ability for those institutions to do much more than collect, archive and display computer game collections is severely limited by intellectual property rights and the lack of any legislation or regulation empowering legal forms of preservation activity beyond technological preservation.

Relying on a technological preservation approach of collecting hardware, software and the paraphernalia surrounding games cannot be relied on as a *permanent* solution to providing access to these materials, and yet on the basis of this research, it is essentially the *only* effective method of preservation which does not break the law. Emulation should offer obvious benefits for preserving games and gameplay, but comes with a range of thorny intellectual property issues which favour rights owners over preservation for future generations. Therefore, the preservation of computer games at present is based on imperfect solutions – the collection, storage and display of computer games and paraphernalia, with arguably the more important issue of preserving *gameplay* being beset by legal ramifications. The actions of the four institutions interviewed for the paper reflect this dichotomy.

If these collections are to withstand the test of changing times and technology, there is an obvious need for a more committed strategy to ensure this happens. Debates need to take place between the academic community, the computer game industry and the heritage institutions to resolve the barriers and challenges of digital games preservation. Only then will digital game history be assured a secure place within digital heritage. Whether this desire is fanciful, or a potential reality, remains a moot point.

## Bibliography

Aarseth, E., 2001. Computer game studies: year one. *Game studies: the international journal of computer game research*, 1(1).

Available at: <http://www.gamestudies.org/0101/editorial.html>

Avedon, E.M. and Sutton-Smith, B., 1971. *The study of games*. London: John Wiley & Sons.

Barwick, J., Dearnley, J. And Muir, A., 2009. Where have all the games gone? In: DIGRA 2009: Breaking New Ground - Innovation in Games, Play, Practice and Theory, Brunel University, West London, 1st - 4th September.

Best, D., 2008. Interview with Duncan Best, Events Manager for ELSPA and Director of the London Games Festival. Conducted by Joanna Barwick.

Bryman, A., 2008. *Social research methods*. Oxford: Oxford University Press.

Caillois, R., 1962. *Man, play, and games*. Thames and Hudson.

Cheung, A., 2007. Video games now available at University of Illinois Library. *University Wire*, 20 February 2007.

Computerspiele Museum,. *Computerspiele Museum* [website].

Available at: <http://www.computerspielemuseum.de/english.html>

Cornell University, 2007. *Digital preservation management tutorial* [Online]. Available at: [http://www.icpsr.umich.edu/dpm/dpm-eng/eng\\_index.html](http://www.icpsr.umich.edu/dpm/dpm-eng/eng_index.html)

DiGA,. *Digital Games Archive* [website].

Available at: <http://www.digitalgamearchive.org/home.php>

Dyson, J., 2009. Interview with Jon-Paul Dyson, Strong National Museum of Play. Conducted by Joanna Barwick.

Evans, L., 2008. Interview with Liz Evans, Nottingham University. Conducted by Joanna Barwick.

Huizinga, J., 1970. *Homo ludens: a study of the play element in culture*. Paladin.

Jones, M. and Beagrie, N., 2001. *Preservation management of digital materials: a handbook* [Online]. London: British Library. Available at:

<http://www.dpconline.org/graphics/handbook/>

Jones M. and Semple, N., 2006. Mind the gap: digital preservation needs in the UK. *Ariadne* (48) [Online]. Available at: <http://www.ariadne.ac.uk/issue48/semple-jones/>

Juul, J., 2005. *Half-real: video games between real rules and fictional worlds*. Cambridge, Mass.: MIT Press.

Kucklich, J. (2006) Literary theory and digital games. IN: Rutter, J., & Bryce, J. (Eds.). (2006). *Understanding digital games*. London: Sage.

Kvamme, B., 2009. Interview with Bo Kvamme, c64tapes. Conducted by Joanna Barwick.

Lange, A., 2009. Interview with Andreas Lange, Computerspiele Museum, Berlin. Conducted by Joanna Barwick.

Lauwaert, M., Wachelder, J. and Van de Walle, J, 2007. Frustrating desire - On repens and repositio, or the attractions and distractions of digital games. *Theory, culture and society*, 24(1), pp. 89-.

Lavoie, B. and Dempsey, L., 2004. Thirteen ways of looking at ... digital preservation. *D-Lib magazine: the magazine of digital library research* [Online], 10(7/8). Available at: <http://www.dlib.org/dlib/july04/lavoie/07lavoie.html>

Leonard, J., 2009. Interview with Jim Leonard, founder of Mobygames. Conducted by Joanna Barwick.

Lowood, H., 2009. Interview with Henry Lowood, Stanford University. Conducted by Joanna Barwick.

Lowood, H., 2004. *Playing History with Games: Steps towards Historical Archives of Computer Gaming*. Paper presented at the Electronic Media Group Annual Meeting of the American Institute for Conservation of Historic and Artistic Works Portland, Oregon, June 14, 2004. Available at: <http://aic.stanford.edu/sg/emg/library/pdf/lowood/Lowood-EMG2004.pdf>

Newman, J., 2009. Interview with James Newman, Bath Spa University. Conducted by Joanna Barwick.

NVA, 2008. *National Videogame Archive* [website]. Available at: <http://www.nationalvideogamearchive.org/index.php/about/>

OAC,. Guide to the Stephen M. Cabrinety Collection. *Online Archive of California* [website]. Available at: <http://content.cdlib.org/view?docId=kt529018f2&chunk.id=c02-1.8.5.2.7&brand=oac>

Owen, J.M., 2007. Preserving the digital heritage: roles and responsibilities for heritage repositories. IN: DE LUSENET, Y., & WINTERMANS, V. (Eds.). (2007). *Preserving the digital heritage: Selected papers of the international conference*. Netherlands: National Commission for UNESCO.

Pinchbeck, D., 2009. Interview with Dan Pinchbeck, University of Portsmouth. Conducted by Joanna Barwick.

Ritsumeikan University, 2006. Video Game archive project. *Ritsumeikan*, 2(1). Available at: <http://www.ritsumei.ac.jp/eng/newsletter/winter2006/videogames.shtml>

Salen, K. and Zimmerman. E., 2004. *Rules of play: game design fundamentals*. Cambridge, Mass.; London: MIT.

Sefton, J., 2009. Interview with Jamie Sefton, section manager, Game Republic. Conducted by Joanna Barwick.

Simons, I., 2008. Interview with Iain Simons, Nottingham Trent University. Conducted by Joanna Barwick.

Stanford University Library,. *The Stephen M. Cabrienety Collection* [website] Available at: <http://www-sul.stanford.edu/depts/hasrg/histsci/index.htm>

Strong National Museum,. *Strong National Museum of Play* [website]. Available at: <http://www.strongmuseum.org/>

TASI (Technical Advisory Service for Images),. *Establishing a digital preservation strategy* [Online]. Available at: <http://www.tasi.ac.uk/advice/delivering/digpres2.html#dp3a>

Task force on archiving of digital information, 1996. *Preserving digital information: report of the task force on archiving of digital information* [Online]. Washington DC: Commission on Preservation and Access and Research Libraries Group.  
Available at: <http://www.oclc.org/programs/ourwork/past/digpresstudy/final-report.pdf>

Woolley, T., 2008. Interview with Tom Woolley, National Media Museum, Bradford. Conducted by Joanna Barwick.