

'More like an arcade' – The limitations of playable games in museum exhibitions

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Abstract

This study investigates the relationship between playable, interactive games on original hardware and the representation of game culture using the case of the exhibition *GameOn 2.0*, often considered to be the largest exhibition of digital games in the West so far. Qualitative interviews with museum staff were used in order to elicit their perspective on the relationship between playability and contextualization. Our results suggest that play as a way of engaging with games as museum objects has limitations which make it necessary to add other means of contextualization in order to afford critical engagement with digital games as cultural heritage. Play excludes visitors who lack necessary gaming skills as well as many genres of games which need longer or different kinds of interaction than a museum can allow for in the context of an exhibition. Moreover, we show that not all games can be exhibited in the same way and that we need to adapt exhibition strategies to individual games and their properties and contexts.

Key words: digital games, exhibition, cultural heritage, interactivity, game culture

Introduction

As digital games increasingly move into the mainstream of western cultural life, issues have arisen of how to handle their preservation and presentation in cultural institutions like museums, art collections, and archives (Barwick *et al.* 2011.) Preservation of games as contemporary cultural heritage has been the key issue so far (Bartle 2014; Gooding and Terras 2008), but deeply intertwined with this is the question of how to exhibit them, both for exhibitions today and to guide future preservation efforts. A central and specific question for digital games, due to their high level of interactivity, is how to treat 'play'. A prominent stance in previous literature on the exhibition of games is that games should be playable in exhibitions and ideally run on original hardware in order to offer a play experience that is as close to the original as possible (Guins 2014; Newman 2012a). However, in studies of games outside of museums, researchers have increasingly highlighted how important contextual issues are for understanding the role digital games play in contemporary society (Swalwell 2013). Thus, it is not clear how far playing original games reaches in offering insights into these broader issues and how high levels of interactivity in a game exhibition interact with additional layers of information and context that reflect on these topics. In museum studies, it has been argued that the explosion of digital technology and a current political agenda which makes museums accountable for visitor numbers: '...combine to give 'interactivity' an institutional significance that increasingly pervades the development and redevelopment of exhibits, exhibitions, galleries and museums' (Heath and vom Lehn 2003: 267). However, interactivity in the form of visitors' interaction with digital technology comes with its own host of difficulties (Heath and vom Lehn 2003).

The aim of this study is to explore the relationship between playable, interactive games and game culture in the exhibition of digital games. We do so by drawing on a case-study of the *GameOn 2.0* exhibition, hosted by The National Museum of Science and Technology (hereafter TM) in Stockholm, Sweden (25 October 2013 - 28 September 2014). We use a set of qualitative interviews with museum staff in order to understand their experiences and perspectives from this exhibition. The study aims to inform research as well as the practical

work with preservation and exhibition of digital games in such institutions as archives, libraries, and museums (ALM sector).

Previous research

Previous studies on game exhibitions focus on games as artefacts in a classical museum perspective and stress the importance of playability. In games studies, however, many studies highlight the importance of the lived practice and cultural circumstances of gaming, so called immaterial heritage. This section will review and combine these perspectives into the theoretical framework for the analysis.

Playable games on original hardware

The presentation of artefacts is often a default position for museum exhibitions (Swalwell 2013). Original artefacts preserved in museum collections are understood as the central carriers of cultural meaning. Guins (2014) argues that even unplayable digital gaming hardware can offer insight into, for example, the history of computing. However, he concludes that the preservation and exhibition of games as technological artefacts to be observed but not played by visitors is not enough. In addition, *play* needs to be preserved and presented (Guins 2014). Newman (2012a) arrives at a similar conclusion, stressing the importance of gameplay besides presentations of the artefacts. Lowood (2002), in the same vein poses, the question: 'Text or performance? Artefact or activity?' This question has a long history in game studies. Aarseth (1997) sees playing games as similar to reading an ergodic text, that is, needing input and effort to be traversed. This view stresses that the material and digital artefacts commonly referred to as games are only one part of what constitutes a game. This means that not only do the artefacts matter for any definition of what games are, but also the practice of playing, which shapes the content, meaning, and materiality of the games (see also Consalvo 2009). Here lies a strong argument for the importance of play in the preservation and exhibition of games. This argument is mirrored on the side of museum research where a shift in museum work from artefacts and objects towards audiences and audience experiences (Hooper-Greenhill 1992; Roppola 2013;) has entailed an increased focus on entertainment alongside education as key museum goals (Witcomb 2006).

Another issue is that of playing on 'original devices'. Game storage media like CDs and cartridges decay (Newman 2012a) and there is a need for emulation as a long-term preservation strategy (Pinchbeck *et al.* 2009; Van der Hoeven *et al.* 2008) which is problematic because of intellectual property (IP) and copyright issues (Barwick *et al.* 2011; Lowood *et al.* 2009; McDonough *et al.* 2010). Another limitation of this approach is that original hardware for historic games is not produced any longer and is difficult to maintain and repair. This makes it a finite resource that will deplete, making this an unsustainable approach to preserving games. Besides the practical and legal problems of play on original hardware there are other, more general aspects which makes a truly original experience unachievable. Games are not only released in different versions, but are continuously updated, as well as partly developed and built upon by players creating content themselves (Prax 2015; Guins 2014; Newman 2012b).

Games in culture and game culture

Games exist within a broader gaming culture that extends beyond the game itself and that in turn also exerts an influence on them, their creation, and their cultural relevance (Shaw 2010). There are multitudes of player-created texts, such as fan fiction (McDonough *et al.* 2010), wikis, let's play videos, guides, mods and more; the so-called paratexts of gaming which can potentially even de-center the game as the central text (Consalvo 2017). A wealth of research has investigated game culture with a focus on the production of games (Jenkins 2006; Pearce *et al.* 2011), whether by companies (O'Donnell 2014) or by players (Prax 2016). One focus has been the financial benefit of player-created content for the games industry and the exploitation of player labour (Postigo 2016; Terranova 2003) also from a legal perspective (Lastowka 2011). When aiming to make visitors understand the cultural importance of games a central question becomes that of valuing the relevance of player culture and player-created

content. Gaming culture has nurtured some of the most prominent and influential online content producers on YouTube (based on subscriber numbers and videos watched) and esports (electronic sports; competitions in digital gaming) is a growing phenomenon (Taylor 2013). But studying games in and as culture require the net to be cast even wider. Games as artefact and practice are entangled in much wider societal and historical processes. They are part of children's and adolescents' everyday lives (Sjöblom 2011) and connect to families, leisure, and school (Eklund 2015). Digital games today are then more than popular cultural objects. A critical heritage perspective draws our attention to the socio-political complexities that surround the construction of cultural heritage and to the challenges and opportunities of the preservation process (Winter 2013).

Indeed, looking at the socio-political complexities in games and game culture has been central in much game research. Some central topics has been: questions of games and gender such as harassment of female gamers, esports athletes, and game developers (Shaw 2010; Mortensen 2018); the production of games with issues such as ownership and power in cultural creations (O'Donnell 2014; Prax 2016); and potential negative effects of gaming such as violence and addiction as violence and addiction (van Roij *et al.* 2018). Topics such as these need to be addressed in some way in preservation and exhibition as they are key in understanding the phenomenon of games today.

Material and immaterial aspects of digital games

Game culture references in everyday language, cosplay competitions where players dress themselves in self-build game character costumes, and games such as *Pokémon Go* (Niantic 2016), where online organized player groups gather on main squares of towns and play together, are all examples of games as not only material but also immaterial culture and these immaterial aspects are central for understanding and explaining them (Smith 2006; 2013). Games come to life through the act of playing but need contextualization to illustrate their socio-cultural relevance. Both playable original games and an engagement with gaming and game culture as immaterial cultural heritage (Kurin 2004) where doing and creating meaning in a living and social context would seem to be key elements in game exhibition. According to Harrison (2013) an increased focus on immaterial heritage is connected to processes where the difference between heritage institutions' 'official heritage' and 'unofficial heritage', which is maintained by other actors in society, is diminished. What constitutes heritage is then not set in stone, but always changing and critical heritage studies asks us to also include controversies and struggles; which in game research and societal discourse has been important topics. The recognition of games as valid and valuable culture should not come at the cost of white-washing them and issues that are part of what makes this culture such a central and important aspect for understanding this moment in human culture. As Lowenthal (2015) so eloquently puts it:

[...] we need to embrace the vile along with the valiant, the evil with the eminent, the sordid and sad as well as the splendid. For the whole of the past is our legacy (Lowenthal 2015: 610)

Attempting to see games as both material and immaterial artefacts for museum preservation and exhibition amounts to a view of digital games not being primarily material artefact, software, players, practices, or cultural 'context', but a fundamental intertwining of these in assemblages of play (Taylor 2009). That is, 'We are no longer looking at just a 'technology' and its 'users' but the event of their relationships, of their reciprocal configuration' (Giddings 2006: 160). So how do museum exhibits focusing on the original experience manage this intermingling of the material and immaterial? In order to investigate the relationship between the material and immaterial while paying attention to controversial issues we now turn to the case of a game exhibition focusing in playable games.

Method

This study draws on a case study of the exhibition *GameOn 2.0*. *GameOn 2.0* is an exhibition of playable digital games originally produced by the Barbican in London that has been touring the world since 2010 and is an updated version of *GameOn* from 2002. Before TM hosted the

exhibition, it had been in Canada, Hungary, Norway, the U.S., Greece, and Australia (Barbican 2016). *GameOn 2.0* stayed at TM from October 25, 2013 to September 28, 2014. This is a comparatively long period for the museum to host a rented exhibition; it was prolonged because in terms of visitor numbers it was TM's most successful exhibition. TM accommodated more than 100 games played on original hardware from the original exhibition. Although an external production, it allowed curatorial choices regarding the selection of titles to be displayed and the arrangement of the exhibition. The stated aim of the *GameOn* exhibition—according to Conrad Bodman, the original curator—was to '... look at the history, culture and the future of video games and try to unlock that for the general public' (Hill 2008). Similarly, the exhibition was described on the TM web page (www.tekniskamuseet.se) as aiming to inspire curiosity about game development, sound design, character background stories, game culture, and the history of game marketing.

Our study of *GameOn 2.0* relies on a series of interviews carried out with TM staff between 2014 and 2015. All interviews used a similar semi-structured design and focused on informants' professional and gaming background, their role within the exhibit, their concrete work tasks and experiences from the exhibit, and the curation process of the exhibition in the museum. As such, the study is focused on the staff's experiences on working with *GameOn 2.0* and their perceptions of the interactions between visitors, staff, and games in the exhibition. It focuses on their expert opinions, rather than for example visitors' experiences. These sorts of interviews provide information on the visitors' interaction with the exhibition's displays, but also 'to what extent the goals of exhibition creators are being successfully conveyed to visitors or if something is being lost in translation. Such research can help pinpoint disconnects between curatorial intentions and outcomes and help generate ideas about how to address them' (Tucker 2014: 348). This approach allowed us to explore the long-term experience of the staff and tap into themes that might not have been visible in the exhibit.

The interview guide was created by visiting the exhibit on multiple occasions and participating in a guided tour. All three authors visited the exhibition for around an hour during open hours on more than one occasion, both interacting with it and simply observing others interact. We also investigated the written material that accompanied the exhibit, from promotion material and set-up instructions to signs and visual design elements. These ethnographic observations, together with knowledge from previous research, laid the ground for the interviews. Informal discussions with museum staff about the exhibit were also integral to identifying which staff members we should approach for interviews. As the authors were also partially employed by the museum as researchers it was natural to spend part of the working week at the museum interacting with staff and participating in the museum's activities.

Broad and open questions were asked in the style of semi-structured interviewing (Hayes 2000). Interviews allow capture of in-depth information and, in our case, to sound out the opinions of those working with the exhibition first hand (Cote and Raz 2015). We decided on individual interviews (rather than, for example, focus group interviews) since the topic—discussions about ones' workplace—had the potential to be sensitive (Lindlof and Taylor 2017). However, all informants except one who could not find the time agreed to participate in the study and allowed us to record the sessions. The informants were all told about the purpose of the interviews, and we stated that we would not refer to them by name in any written reports or research.

The interviews, a total of six, were transcribed in full and all quotes has been translated by the authors. An inductive thematic analysis (Ryan and Bernard 2003) was carried out, first by reading and re-reading the transcripts and then discussing them. In a second, deductive, step, a thematic qualitative coding (Braun *et al.* 2012) was done using the overarching analytical categories drawn from the data in combination with relevant theory (Ryan and Bernard 2003). These categories were, on the one hand, 'playable games on original hardware' and on the other hand the 'socio-cultural context of games'. These were coded separately by the authors and then discussed until consensus was reached. The result section below is structured according to these themes and starts out with discussing playable games and their limitations and advantages to then connect to their cultural context.

Results and analysis

Playable games on original hardware

When entering the exhibition one was faced with its materiality; one of the first items was an out-of-order original *Pong* (Atari 1972) arcade machine. This and some other non-playable arcade machines, together with a glass case of hand-held digital games, were examples of the few games that could not be played. Instead, they served the purpose of highlighting the historical development of digital games. Interaction with games—a smorgasbord of digital games covering an extensive time period—were key for the exhibition and as such emphasized play as the central aspect. ‘Fun’, ‘interactive’ and ‘positive vibe’ were three terms frequently used by informants to describe it.

It really is good, of course, that they go with these old consoles... because it's a very special feeling to play on these old ones that you can't really recreate with emulations (Interview with exhibition staff)

As in the quote above, the staff involved with the exhibition highlighted the unique opportunities that *GameOn 2.0* offered; access to original games and consoles collected by curators in one place and made available to a large audience. The high number of games was highlighted in the advertising of the exhibition and was also, according to the informants, what made it such a success in terms of visitor numbers. *GameOn 2.0* was structured, in one informant's words ‘as a giant arcade’. Or as the informant below states:

It turned out a lot to be a gaming hall where you could play stuff... which is fine. Just, you know, maybe, if you want people to understand more about what computer games actually are you would want to have some more information or something (Interview with exhibition staff)

The exhibition also contained a section on arcade games; its final room was lined with many kinds of arcade machines. However, while it did well at representing this historical kind of gaming experience, a side of gaming that many children visiting were likely unfamiliar with, it also lacked the crucial aspect of the coin-operation of arcade games. This economic principle was not explained and could easily have been missed by, for example, young visitors, as the informant below explains:

It's like, the information might not have gone through, [...] like why it looked like [this], that you actually had to go and play these [games] somewhere in your arcade hall; that might not have been transmitted, or that you had to pay to work these machines, maybe that wasn't clear (Interview with exhibition staff)

That the museum replicated an arcade hall did not communicate the social setting, economic logics, and the reality of the arcade hall as a specific, historical place. Relevant elements of arcade gaming, such as the competitiveness based on the pay-to-play model and persistent high-scores, or arcades as meeting spaces for particular groups of people, could not be replicated in the sterile, but also safe, environment of the museum.

An incomplete canon and the limits of playable games in exhibitions

While the exhibit presented a wide array of games, some entire genres and game types were absent. For example, games with an age rating of 16+ were only displayed in a few choice cases as it was expected that many children would visit the exhibition. Only a few PC games were exhibited. PC games take a lot of maintenance in order to keep the right hard- and software functional compared to console games. The titles included were successful and professionally published games. This meant that alternative, local, persuasive, controversial, or artsy games were not represented; turning the exhibition into the history of only a selected part of the mainstream game industry. This is problematic as it further marginalizes these facets of the culture and supports a hegemonic picture of games as commodities produced by an industry.

Another logic for the exclusion of games was genre, as stated by this informant:

There was a lack of, for example, RPG-games and the like, which was not so good, and then it was—well, what to say? The posters said 'The world's largest computer game exhibit', but there were only two computer games, and the rest were console games and arcade machines (Interview with exhibition staff)

Genres like strategy games, role-playing games (RPGs), and Massive Multiplayer Online games (MMOs) which are key to unlocking the history of digital gaming were frequently missing. These genres were omitted because they did not lend themselves to game exhibitions with a focus on play. The amount of time that needs to be invested in an MMO or other role-playing games in order to get an understanding of what it is about is several orders of magnitude more than what is available to an exhibition visitor.

It [the exhibition] did not try to get you to invest all that much into a game, maybe because the point is, as I mentioned before, very much 'play a game for five minutes' (Interview with exhibition staff)

Visitors in general spent a few minutes on each game as the informant above explains, hardly enough to understand a MMO game like *World of Warcraft* (Blizzard 2004) with its emergent social connections and living subcultures (Chen 2008). So while *World of Warcraft* was displayed in the exhibition, it was clearly not adapted to the museum setting:

If I go there and play *World of Warcraft* and I have a hard time walking through the forest and looking, adjusting the camera, then why do people spend thousands, tens of thousands of hours' worth of playtime on this game? That I do not understand from playing it for a short time in a museum (Interview with exhibition staff)

As the informant explains, the complexity of some games makes it difficult to exhibit these in a museum that focuses on the interactive nature of the 'original experience'. The exhibition's focus on playable games meant that these titles were not, or only poorly, exhibited. In *GameOn 2.0* this problem was experienced as exaggerated by the creation of a de-facto games canon that excluded some games such as PC games, that could have fitted the criteria favouring important game industry products yet were excluded as they were hard to exhibit.

Play as exclusive and affirmative

Another limitation of the approach that heavily favors playable games is that the exhibition excludes visitors who lacked previous knowledge on how to play. A common theme in the personnel's narratives of the exhibition was that playing games required prior knowledge and skills. Frequently this related to the concrete physical manipulation of controllers, where visitors might hold them upside down, or where the mapping of names of buttons and where to press was far from transparent to novice users, as in the quote below:

[...] every time an X appeared on the screen and they got a hint they were completely confused and didn't understand that the X there means the X on the thing they were holding [...] (Interview with exhibition staff)

Informants argued that the prior knowledge needed for visitors was a weak point in the exhibition, stating that it worked well for gamers but less so for people with little or no previous gaming experience. An exhibition that relies on play as the central way to communicate about games requires gaming literacy on the side of the visitors. In other words, it does not communicate well with those who do not know how to play.

GameOn is very confirming. If you are a computer gamer, you go in there and you see all the stuff you played and you can play. If you are not a gamer, you go there and you look at these games and it is very hard. You get confirmed in your view that this is hard and not for you (Interview with exhibition staff)

As the quote shows, an exhibition that focuses on play runs the risk of losing the ability to open up games as a part of culture and their relevance for understanding life today to new demographics and groups who have not been gamers before. It might even re-affirm their prejudices of games not being for them.

A second element of this issue is that even on the side of the museum personal there was a perceived need to have personal knowledge about games in order to be able to effectively work in and guide the exhibition. The training for the employees was not seen as sufficient and required them to already have gaming literacy.

Connecting play

Even though there were difficulties in the exhibition, the staff experienced positive effects of the playable games approach as it, for example, led to intergenerational interaction and learning.

There were also a lot of children and grandparents, for example. [...] You could see a grandmother beat her grandchild in *Pong*, so that was fun. But, like, they [the grandparents] couldn't play anything else. When they played *Halo* they were completely lost, then they'd walk up to *Pong* and beat their grandchild, so that was fun (Interview with exhibition staff)

The exhibition promoted cross-generational interaction, with parents presenting games to younger generations that they had played as children, and children presenting newer titles to their parents. The interaction between visitors, either inter-generational or between different visitor groups and even between visitors and the staff worked, according to our informants, best in multiplayer games. There were several multiplayer games, most of which consist of two players playing cooperatively or against each other. Multiplayer games with more players were scarcer. *Halo* (Bungee 2001) and *Super Smash Bros* (Nintendo 1999) stood out as the two games that consistently gathered crowds, both for playing and spectating, and were considered two of the most popular displays by the staff.

[...] Super Smash Bros and Halo were always, always, always occupied, and then people, like, got to talking [...], people got to know each other there (Interview with exhibition staff)

We know from previous research that visitors seldom go to museums alone; going in groups is the norm (McManus 1989). Interactive museum exhibits in general often fall victim to a single user problem, where they are designed for interaction by one person at a time, which hinders interaction with one's co-visitors (Heath and vom Lehn 2003). This was mirrored in the exhibit, in that single player games promoted less social interaction. On the other hand there is interesting potential for multiplayer games to inspire other types of social, digital museum experiences. In this context, staff in our study experienced that social games supported the social nature of the visit. These types of games are also, often, easy to pick up and play in a short time, further supporting the logic of an exhibition.

Not enough context

Despite this advantage of playable games, our results indicate that as a games exhibition, *GameOn 2.0* limited itself when exclusively relying on playable games and this made further contextualization necessary according to our informants. Foremost, the lack of written information alongside the games themselves was seen as a problem. Almost no signage accompanied the exhibition except for instructions on how to play the various games. As one informant described it:

[*GameOn 2.0*] lets the games really speak for themselves. 'Here, play a lot of games!' It feels like they are not trying to be anything else than that either (Interview with exhibition staff)

The signage felt disconnected and informants agreed that they made little sense to visitors—or to the staff for that matter—as they did not convey what made these games important and did not explain their role in culture. The staff also highlighted how the playable games overshadowed what few signs there were; amidst all the noise and blinking screens any printed signage simply disappeared for the visitors' eyes. The playable games demanded the visitors' complete attention, as discussed below:

Even when we explained why people played certain games then visitors could still just go 'A, ok...' because they did not get it and because they mostly stood there and played the games. [...] That was basically the thing, because games are fun and draw you in, they are attracting your attention which makes it very hard to build anything around them. That seems to be the tough part, because they are made so that one gets pulled in immediately and because it is hard for people to focus on anything else than playing the game. (Interview with exhibition staff)

The second element that added context besides signage were guided tours. These were carried out by the personnel we interviewed and underwent significant changes during the time the exhibition was hosted at TM. Initially the museum offered guided tours with a focus on issues such as the representation of gender in games. However, these tours were faded out because they did not work well. One of the reasons for their failure according to staff, related to the playability of the games in the exhibition:

The museum tried to have a workshop with a school. The plan was that a student group should take a look specifically at the gender roles in games. A great idea, fantastic actually. That said, it was very hard to get them [the members of the student group] to actually think about or to focus on this topic. It was a lot of going around and playing and then writing something up in the last second (Interview with exhibition staff)

The high number of visitors in the museum made tours during normal visitor hours difficult. According to the guides it was impossible to keep the attention of a group during a tour through the playable games. On the one hand visitors left the tour guide in favour of playing the games, and on the other hand it was not ideal to guide a group of visitors through a landscape of playable games they were not allowed to play. In the end, a limited number of tours were organized were visitors first followed the guide through the exhibition from start to finish and were then set free to explore it and play the games. This setup was not perceived as ideal but was an adaption to the resistance of the playable games to contextualization.

Critical perspectives

According to our informants, the focus of *GameOn 2.0* was on the parts of digital gaming that created an enjoyable atmosphere, and on material artefacts. This proved difficult to combine with immaterial aspects of gaming culture. For example, no controversial themes in gaming culture were included, such as the alleged connection between games and violence or addiction, the representation of women in games (as well as other gender-related issues), or the means and modes of production of digital games, while such parts of game culture as LAN-events or esports were also left out altogether. While some lack of a critical perspective is related to the selection of games in the exhibition to be accessible for children (e.g. no games with excessive violence or depictions of explicit content) there were two cases in particular where the museum through active curation of the traveling exhibition furthered the enjoyable atmosphere. The first centers around the representation of female bodies in games while the second deals with the issue of the unsustainability of using original hardware. Indeed, as Witcomb (2013) has argued, there has been an increase in museum exhibits which deal with difficult subjects. Exhibits do not have to provide pleasant experiences for visitors but can instead attempt to create unsettling experiences which can provoke visitors to consider difficult or dark histories in new ways (Witcomb 2013).

When the exhibition arrived from the Barbican the curator at TM rejected a description text that explained the origin of the body shape of Lara Croft, a female protagonist in the *Tomb Raider* (Eidos 1996) game series whose oversized breasts (initially a design implementation error) were kept in the published game. The curator felt that an exhibition which did not address the shapes of the bodies of other characters should not exclusively discuss large breasts in a female character, and ordered the text changed. Below an informant explains the rationale behind this decision:

They have five characters. One is a woman. What do they say about her? So I read Lara Croft's sign and first there is a paragraph about 'Lara Croft is a cool

action character bla bla.' [...] And then it was something about her breasts. [...] We are in Sweden. We are a feminist country. I actually wrote this to [two of the creative responsible personnel]. [...] She is the one female character you have and you talk about her breasts! (Interview with exhibition staff)

However, one could have imagined another option where the museum had discussed the depiction of women in games and potentially cultural differences between the UK and Sweden. In conjunction with the break-down of themed guided tours that were initially meant to examine questions of game culture and gender this was particularly problematic because these issues were not addressed by the exhibition at all.

The second opportunity for critical reflection on the role of the exhibition and visitors themselves in it, could have been offered by showing the amount of electronic waste and destroyed historic artefacts that the exhibition created as a side-effect of letting players use and break original hardware.

I get kind of sad when I see that they have to exchange such old controllers because there is really only a limited number of those things left. So in the end with this exhibition we are slowly but steadily chowing through a lot of these old things (Interview with exhibition staff)

As the informant explains, the exhibition was part of diminishing the availability of hardware for future generations. It travelled with a supply of original hardware and constantly bought more to be able to sustain itself. Yet this fact was in practice hidden from visitors, who were the ones, unbeknownst to them, taking part in this quite destructive process. Making this dynamic accessible could have helped visitors to understand the fragile nature of cultural heritage and the unsustainability of this very exhibition and its methods. All which are key issue facing the preservation of digital games today (Guttenbrunner *et al.* 2010).

Discussion

The limits of playable games in exhibitions

GameOn 2.0 focused on simulating the original experience by giving players the option to play historic games on original devices and thus allowed the games to speak for themselves. The analysis of this approach shows structural limitations of playable games as museum objects. In principle, anyone could play any game and thereby understand some of the meaning and importance of that experience. In actual practice, our interviewed staff working in the exhibition experienced that players without prior skills were often left confounded and without the literacy required to participate in the gaming activities. This also meant that visitors got the best access to games and parts of gaming that they were already familiar with while the exclusion of non-gamers was reinforced. This in a cynical way reminds us that games can be seen as ergodic literature (Aarseth 1997) and that some players were not capable to traverse the text. We argue that this is a general limitation of play as a form of communication in game exhibitions. Other attempts at including interactive, digital elements in museum exhibits has highlighted that digital technology in the form of interactive elements can distract visitors from physical artefacts (Back *et al.* 2018). Finding a balance between physical artefacts, interactive elements, and the immaterial is a far from trivial issue facing exhibition. However, the exhibition staff noticed how visitors themselves somewhat compensated for this, using play activities as starting points both for interaction and conversations about games among themselves, and with the staff. Games dedicated to multiplayer lent themselves best to this, especially those with more than two-player capacity. In this way playable games as museum objects supported the social nature of a museum visit and redeemed themselves to some extent.

The second structural limitation lies in the interplay between the museum setting and the requirements of time for certain game genres. Genres that require extended periods of game time to reveal what their games are about, even on a basic level, like social interaction in virtual worlds or intricate narratives around unique characters in RPGs, could not convey these topics; which were what made them relevant to the exhibition and gaming culture in the first place.

Finally, we found that playable games resisted contextualization. By drawing the attention away from not only signage but also guided tours and other kinds of contextualization they made it particularly difficult to simply add a layer of information on top of them. In the case of *GameOn 2.0* this resistance forced guided tours to adapt and led to the end of focused visits to the exhibition by for example school classes that were expected to discuss games and gender after collecting information in the exhibition, as these visits did not produce the expected learning outcomes. From our data it is not clear if this is a property of playable games specifically or a general dilemma in interactive exhibitions. However, as interactivity is a reality of playable games this is something that museums who want to exhibit playable games need to relate to.

These limits of play as a medium for communicating about game culture highlight the need for contextualization. The explicit aims of both TM and the Barbican (as formulated by Bodman (Hill 2008) and on the TM web page) stressed education about economic, societal, and cultural aspects of digital games and the preservation of games as culture and art history. However, play could not by itself offer this appreciation of the cultural-historic relevance of a game. As shown in this study, games need added information, guidance, or narration to provide contextualization in order to make digital games as a culture fully available to visitors to museums, both now and in the future. As shown in our data, adding layers on top of interactive games were experienced by staff working with the exhibit as far from trivial. This requires critical reflection on the part of researchers and ALM institutions concerning issues of production and co-production, as well as representations related to gender, race, class, violence, addiction, and player-created culture exploitation to name a few. Showing the relevance of game culture beyond play in games exhibitions could perhaps also enable and motivate organizations in the ALM sector, alongside playable games, to also preserve relevant aspects of game culture.

The next generation of game museums

GameOn 2.0 is, while still touring the world, by now a somewhat dated exhibition of digital games that fulfilled an important role by bringing digital games into museums. However, as we approach a state where digital games are becoming incorporated into museum work we need to move on to asking how we can provide critical engagement and understanding also with immaterial aspects of games and gaming culture in exhibits. Moreover, game exhibits do not have to shy away from the dark aspects of games and game culture but can take inspiration from exhibits lifting up and embracing so called dark histories (Witcomb 2013).

While artefacts can be used as a point of departure to grant museum visitors an improved understanding of the sociocultural relevance of certain immaterial practices (Swalwell 2013) they should not be the only way games are exhibited. In discussion on preservation of digital games authors have stepped back from encouraging playable games. While they do not disregard it completely, they instead argue for a shift in focus towards preservation of for example player stories which aim to show more of the circumstances in which these games were played (Nylund 2015; Sköld 2015; 2018), in short, the immaterial aspects of games and gaming culture. This shift in exhibition focus is timely as the paratexts around games are, more and more, proving to be key texts (Consalvo 2017) which also needs to be shown in museums.

It has also been argued that the exhibition of playable games is done by hobbyists and does thus not need to be the focus of the ALM sector (De Kosnik 2016). We do not fully share this perspective both because these 'rogue archives' exist under the constant threat of legal action (due to infringement of copyright laws) and because, as we have shown here, playable games still hold value for the exhibition of games. Games are inherently interactive and removing play from them would rob them of one of their defining characteristics as a medium and form of culture. Games, after all, are meant to be played. Instead of choosing between playable games and immateriality, we argue that exhibitions of digital games could strike a balance between interactivity and cultural and societal contextualization. One way of doing that could lie in engaging with a specific game, understanding its genre and design, and adapting the exhibition to its specific properties. For a multiplayer online game contextualization and possibly recordings of other people playing might be more useful than the playable game while a casual fighting game could work well as a way of getting players to interact and explore the game together. Treating every game the same way means not presenting any of them well. In the context of the discussion in museum research around the relationship between interactivity

(Witcomb 2006; Henning 2006) and participation via digital media use (Kidd 2016) on the one hand and the understanding of museum pedagogy (Witcomb 2013) on the other, this study offers a pointer towards the limitations of an approach that exclusively relies on playable games. A next step could be an audience study of the way in which visitors play games to be able to offer more practical advice and a problematization of interactivity (Witcomb 2006) also in the context of games.

Finally, museums could offer the possibility to visitors to play the games they learned about in the museum later when they are back at home by hosting them in an emulator on the website of the museum. However, at present this remains an area for further research and requires policy changes due to copyright laws. By bringing an arcade into a museum, *GameOn 2.0* makes an important contribution to show that digital games today are meaningful cultural artefacts which belong in museums. The next step concerning exhibition of digital games needs to speak more directly and explicitly to the role of digital games as an integral part of contemporary culture and economy.

Conclusion

This study, through interviews with museum staff, investigated the relationship between playable, interactive games on original hardware and the representation of game culture in the digital game exhibition *GameOn 2.0*. Our results suggest that play as a way of engaging with games as museum objects has limitations which make it necessary to add other means of contextualization in order to afford critical engagement with digital games as immaterial culture. Play excluded visitors lacking necessary gaming skills as well as many genres of games which need longer or different kinds of interaction than a museum can allow for in the context of an exhibition. In these cases, play is not opening up the meaning of these games in the context of exhibition, but rather provides an additional layer of complexity to a subject that is already opaque to many visitors. Additionally, interactive playable games resisted contextualization like signage and guided tours and made it difficult to effectively present information which could otherwise be used to increase understanding of games. The results of our study point towards that this may be a general dilemma inherent in the interactive nature of digital games as exhibitible museum objects. For while we must play games in order to understand them the same interactivity necessary for engagement, in our study, becomes a barrier to comprehending the cultural relevance of games. A museum exhibition with a central focus on playable games and original hardware then runs the risk of falling short of fulfilling the aims that come with the responsibility of many museums.

Future research and game exhibitions could explore how various types of games can be exhibited and recognize that not all games can be exhibited in the same ways. Indeed, for some games, play might be the best way of presenting them while for others, where the skill barrier or the required time input are more considerable barriers, other ways of showing their importance and meaning could be found which could even lie outside of the game text. It could be productive to have both contextualization and play for a particular title but to separate them in order to prevent play from resisting context. Games are diverse and gaming culture even more so, and if we want to both offer playable games and contextualize them in exhibitions we cannot treat all games the same way but need a more refined approach.

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