

Media Format Matters: Users' Perceptions of Physical versus Digital Games

Jin Ha Lee, Dylan Holmes, Brooks Lobe
University of Washington, Information School
Mary Gates Hall, Suite 370, Seattle WA 98195
{jinhalee, aerofin, blobe}@uw.edu

ABSTRACT

Despite the rapid shift in media distribution from physical to digital formats, few studies explore what this means to users with regards to perceived values, limitations, and experience with media. We investigate this problem, specifically within the context of video games, aiming to understand which formats game players prefer and for what reasons, and the implications for game content providers and digital libraries. The findings from a survey of 1,257 game players showed that more respondents preferred digital formats over physical formats. Advocates of digital games typically valued accessibility and convenience, longevity of games free of physical damage, less need for storage, and reduced cost. Advocates of physical games generally valued the ability to easily retrieve, share, and resell games, ownership and longevity of access to games, the paraphernalia and collectibles that came with physical games, and the aesthetic and tangible qualities of the physical object. We discuss the implications of these findings for content providers and libraries, with an emphasis on game preservation efforts.

Keywords

Video games, Media formats, Media distribution models.

INTRODUCTION

In the past decade, the rapid development of tools and technologies has resulted in significant changes in methods of recording, storing, distributing, and accessing media. One of the most dramatic changes is the rapid transition from physical to digital formats, which impacts not only the way people collect and own media but also development of different access models, including subscription and streaming. This phenomenon is happening across a variety of different media including music, film, and video games.

Overall, the gradual increase in the consumption of digital media¹ seems to be a common trend. For instance, according to the Digital Music Report published by IFPI (International Federation of the Phonographic Industry) in 2015, “revenues from digital music service match those from physical format sales for the first time” (IFPI, 2015). Popular media predict physical formats will go obsolete due to streaming based on factors like cost, physical limitations, and longevity as evidenced by the success of Netflix, Amazon Prime, and Hulu Plus (Laird, 2012; Pullen, 2015). Online distribution of games via services like Steam, GOG, PlayStation Store, Xbox Games Store, and Nintendo eShop have also resulted in an increasing use of digital games. Digital sales of games have reached \$5.4 billion in September 2015, and digital console games in particular saw an increase of 29% compared to the sales data from the same month last year (DiChristopher, 2015).

While we understand the radical shift in the market dominance of digital media and the growing preference of digital media over physical format among users, few have explored the reasons users prefer one format over the other and the benefits, limitations, and other meanings each type of format has from a user-centered perspective. Predictions from popular media tend to be based on personal opinions and speculation rather than empirical data. Which factors are being considered by users when they choose to obtain media in certain formats? What are users giving up when they choose one format over the others? What are their perceptions on new available formats and this general shift in access models? In this paper, we specifically explore these questions in the context of video games. We explore the strengths and limitations of digital versus physical formats of video games from users' perspective, and specifically answer the following research question: Which formats do game players prefer and for what reasons, and what are the implications for game content providers and digital libraries?

ASIST 2016, October 14-18, 2016, Copenhagen, Denmark.

Author Retains Copyright.

¹ In this context, we use “digital” as a shorthand for digital media which have no physical component and are accessible only through file transfer or streaming, and refer to digital media in physical formats (such as DVD or game cartridge) as “physical”.

This information is critical for institutions that provide access to media, including but not limited to public and academic libraries. These institutions are already challenged by the advent of ebooks (Percy, 2013; Vaccaro, 2014), and streaming services of other media will inevitably affect future library service models. Users may ultimately dictate what limitations they will accept in exchange for the benefits of digital goods. Understanding what they believe they are giving up during this shift could be useful for organizations like libraries or other commercial media providers; it may help inform design decisions of future services to compensate for these losses in some ways. Although the focus is on video games in this study, the findings will have implications that are applicable not only to the medium of video games, but to users' perspective on physical versus digital media in general.

RELATED WORKS

We found a significant body of work examining the rise of digital media formats and the business and cultural changes brought about by this shift (e.g., Bockstedt et al., 2005; Hayles, 2012; Mareike, 2016), albeit relatively few directly examining user preferences of video game formats. We therefore must situate our findings within the broader realm of papers examining media formats.

A number of studies investigated issues related to different formats in which music was distributed. An early study on new music formats was conducted by Brown et al. (2001), and found that the then-early adopters of digital music “did not appear to replace but rather to supplant conventional media” (p. 69) when purchasing MP3s. They also noted that these music enthusiasts were almost all “music collectors” that took pride in amassing and curating collections of music, with some preferring the tangible objects for display and social exchange. Styvén (2008) found that, while younger consumers as a whole favor digital music formats, there is significant correlation between preference for physical formats and deep involvement in music as a hobby or passion. This reinforced earlier work suggesting that music listeners had greater emotional attachment to tangible records than digital files (McCourt, 2005). Kinnally et al. (2008) found that the primary reason college students downloaded digital music from the web was the inherent entertainment and time-passing qualities of seeking and downloading the music; convenience, economic utility, information-seeking, storage utility, and social interaction were also prominent motivators.

A significant portion of the articles examining game formats uses an industry format, and primarily focuses on the question of how game publishers can remain viable and profitable in the changing market (e.g., Waldner et al., 2013; Jöckel et al., 2008). Tyni & Sotamaa (2011) stood out by examining the rise of digital-only downloadable content (DLC) from the perspective of players, and note that “increasingly often, instead of buying a product, we are in fact being sold a service” (p. 313). The widespread

existence of DLC for physical games – many of which have to “check in to a game server before or even during a single player game” – blurs the line between digital and physical formats. Lee et al. (2014) discuss the implications of digitally distributed games in the library and information science context, advocating for revising and restructuring existing game metadata elements to comprehensively describe digital games.

A small number of papers considered the environmental ramifications of a transition to digital games. Moore (2009) considers whether digital distribution is a solution to the rapid obsolescence of game discs, consoles, and peripherals and the resulting amounts of e-waste, but concludes that the existence of DRM and a continued increase in system requirements present obstacles. Mayers et al. (2014) estimated the greenhouse gas emissions of producing and distributing video games on Blu-ray discs versus internet downloads, and found that the former actually produces fewer emissions.

We found only one study directly analogous to ours. In 2010, Toivonen & Sotamaa conducted a survey of Finnish gamers' attitudes towards the digital distribution of games. Specifically, gamers were asked separate sets of questions about PC games, console games, and browser games. The researchers found a significant correlation between total hours spent playing video games and a preference for digital downloads. Of the respondents who reported downloading games, over 75% identified ease of access, variety of games available, affordability, and ease of purchase as reasons for downloading. Conversely, respondents who did not like downloading games cited ease of return and refunds, and concerns that their downloaded games could disappear as a result of hardware or system failures. Additional interviews with this group showed that they valued both the aesthetics and tangibility of physical games, which gave them “a concrete feeling of ownership, different from the one connected to digital copies” (p. 204), and a general sense that physical games were more reliable and safe. Finally, those who preferred physical games were focused on cataloging and displaying their games. Our goal is to obtain insights that complement the findings of this study which was focused on Finnish game players and specifically discuss the implications in the context of library and information science.

STUDY DESIGN

This study is part of a larger research project aiming to collect user data as a basis for evaluating a metadata schema and encoding schemes designed for video games and interactive media (Lee, Clarke, & Perti, 2015). For the project, we collected user data through two primary methods: interviews of 56 game users and a large-scale online survey investigating various aspects of people's gaming behavior, appeals, search and discovery of games, collection and access methods, and organization of video games. The full survey questionnaire consists of 28

questions; this paper reports findings from analyzing part of the survey results, specifically the responses to the questions listed below asking about the format composition of users' video game collection, their format preference, and reasons for their preference.

[Q9] What percentage of your video game collection consists of physical games versus digital games?²

physical games*: _____
digital games**: _____

The sum must equal 100.

[Q10] Between physical games and digital games, which do you prefer and why?

Survey participants were individuals 18 years or older who play video games and/or seek video game information for various reasons. Invitations to the survey were distributed via multiple online and offline venues including game-related mailing lists, Facebook groups, and Reddit forums. We collected a total of 1,257 complete responses during the seven weeks when the survey was active. More detailed information about the survey deployment including the full questionnaire can be found in Lee, Clarke, & Kim (2015).

Our main goal is to provide a rich and deep discussion on users' perception of values with regards to physical and digital formats of video games rather than make inferences from our data, and thus we adopted a qualitative approach in analyzing our data. In order to analyze the responses to Q10 which were open-ended, we recruited two coders who went through an iterative coding process. The preliminary codebook was developed based on a subset of the responses, and using this codebook two coders independently coded all the responses. Two coders then met to discuss code revisions; some were added, removed, or modified so that they comprehensively cover all the reasons mentioned by the users but are also clear and mutually exclusive. In order to ensure a consistent application of the codes, the coders then revised their previous coding work with the revised codebook. After the coding revision was done, they participated in a series of meetings where they reviewed and compared their coded responses. We adopted a consensus model (Hill et al., 2005) in which two coders identify and discuss any inconsistencies in code application and aim to reach an agreement. In cases where an agreement could not be reached, the first author acted as an auditor and provided additional comments to help reach a consensus.

² In the survey, we provided definitions of physical games and digital games as follows: Physical games – video games with a physical component, such as games accessed via a cartridge, disc, etc.; Digital games – video games that are digitally downloadable, streaming or somehow accessible without a physical component such as cartridge, disc, etc.

FINDINGS AND DISCUSSION

The average age of survey respondents was 27.2 years (SD = 8.0). Of 1,257 respondents, 70.3% identified as male, 26.7% as female, and 1.7% as “other.” The majority of respondents identified as white or Caucasian (76.5%), followed by Asian (9.9%) and Hispanic or Latino (6.3%). Also the majority of them resided in the United States (72.5%), followed by Canada (4.9%), UK (3.7%), Germany (2.2%), Australia (2.1%), and 46 other countries.

The respondents had an average of 18.6 years of gaming experience (SD = 7.1). They used a variety of gaming devices including gaming consoles (73.1%), laptops (64.4%), smartphones (64.2%), desktops (60.5%), handheld gaming devices (42.0%), and tablets (34.3%) (Lee, Clarke, & Kim, 2015). Many respondents also used multiple devices to play games, with an average of 4.52 devices (SD = 1.45) (Lee, Clarke, & Kim, 2015).

Digital games comprise, on average, 54% of respondents' collections with physical games making up the remaining 46%. Respondents displayed a range of preferences, with 47% preferring digital formats, 33% preferring physical formats, and 20% having no clear preference. In stark contrast to the findings of Kinnally et al. (2008), our respondents typically explained their preferences by listing specific, tangible benefits rather than the enjoyability of processes or general experience, as represented in the codes in Table 1. In the following sub-sections, we discuss each of the major themes emerged from the survey responses in depth.

Accessibility and Convenience

One of the most commonly cited reasons for preferring digital games was a sense of accessibility and convenience. This was mentioned both in the context of initially purchasing a game, as well as accessing it on a day-to-day basis (e.g. playing the game). When purchasing digital titles, players “can easily order and immediately start downloading games instead of having to travel to a store or wait for shipping on a physical copy” (ID: 1415). People were most appreciative of not having to leave the comfort of their own homes when purchasing a game. On one hand, convenience played out as efficiency when one saved time. On the other, convenience seemed to serve as a solution to laziness – someone could buy and then play a game from their couch, wearing pajamas throughout the whole process. This contrast also existed when accessing games on an everyday basis, since navigating a screen to choose a different game is much quicker than getting up to change a disc. Those who mentioned a convenience factor of digital games spoke of it as if it was a known fact. Overall, the large number of references to ease of accessibility establishes it as one of the chief reasons that many respondents prefer digital games. This is in line with Toivonen & Sotamaa's survey of Finnish gamers, in which “finding games is effortless” and “paying (for) the purchase is simple” were among the top reasons given for preferring digital games (p. 203).

Code	Description	Physical	Digital
Accessibility & Convenience	Response mentions ease, difficulty, or breadth of access to games across multiple places or devices.	108	415
Aesthetics	Valuing the aesthetic quality of a game such as the visual appearance of the game container or display of a game collection.	74	5
Content	Respondent ties the game's content to the physical/digital form (e.g., some types of games are more common in one format).	24	24
Cost	Respondent mentions financial cost or benefits related to the form (e.g., different cost to purchase, resale value).	55	138
Freedom of Use	Valuing being able to use the purchased game without restriction (e.g., DRM).	38	4
Hardware	Valuing the features or restrictions provided or imposed by hardware or operating system.	16	35
Longevity	The "lifespan" of the game in terms of its long-term playability and any preservation issues that prevent future access.	108	156
Nostalgia	Nostalgia or other warm feelings arising from history with the game's form.	35	0
Organization	The manual or automatic organization or display of a game collection.	21	63
Ownership	Respondents' sense of ownership, or legal ownership rights.	91	1
Paraphernalia & Collectibles	Products that "come with" the games but are not the games themselves, including the game box, game disc/cartridge, game booklet, and game manuals. Also includes extras like artwork, maps, coins, books, jewelry, etc. Includes "digital collectibles" like pre-order bonuses.	72	6
Security	Concerns about the security of game or personal data (e.g., personal profile data, save data, credit card data).	17	2
Sharing/Transferability	The ability to share or transfer games.	85	1
Social	Social/communicative aspect of the game forms, such as how the form mediates playing games with others, the social aspects of displaying their collection, or the social component of sharing and trading games.	50	4
Storage (Space)	Physical or digital space taken up by games, such as hard drive space or physical "clutter."	37	146
Tangibility	The ability to physically touch or hold a game and its paraphernalia.	93	0

Table 1. Summary of the Codebook – Reasons for preferences

Additionally, some respondents cited convenience as a reason for their preference for physical games, albeit a smaller number than digital games. Generally, these cases stemmed either from a bad experience with acquiring/accessing a game digitally, or from an edge case scenario that made shopping at a brick and mortar location an easier prospect, such as below:

"I have purchased digital versions of games on the Xbox Marketplace and some of them haven't downloaded right away or had problems." (ID: 766)

"In addition, it was easier to bring my parents to the store growing up as a child and having them pay for it rather than having to ask them for a credit/debit card." (ID: 2100)

The one prominent accessibility-related reason behind a preference for physical games over digital games was online accessibility (referring to having internet access to download or play games). This often tied in to one's perception of ownership of a game: "If something goes wrong I always have my own copy, I feel like I have physical ownership. If the servers go down, I can always play offline" (ID: 1913). Some respondents saw this issue

from a logistical point of view, where they might not always have a stable internet connection at their disposal. This could prove to be a problem to those who are frequent travelers or live without a high speed internet connection. However, the prevailing sentiments about online connectivity were related to losing access due to a server error or change in company policy.

"I prefer having a physical copy 99% of the time. However IF I have rights to play the game and it isn't arbitrarily linked to a server that might be shut down someday then I prefer digital download AS LONG AS I HAVE THE ABILITY TO KEEP THE GAME INDEFINITELY AS I HAVE OWNERSHIP OVER THAT COPY." (ID: 1070)

Some respondents were particularly vocal about their concerns towards companies changing their views and policy regarding online access. These concerns were prescient; in the time since the survey was conducted, purchased games have been 'pulled' or made unavailable by both small companies (such as digital distribution platform Desura, which suddenly declared bankruptcy in 2015 (O'Connor, 2015)) and large ones (such as Microsoft,

which announced that purchased Xbox One fitness apps would be unplayable as of July 2017 (Welsh, 2016)) resulting in players' loss of online access to games.

Longevity and Control

The single most referenced reason for preferring either digital or physical formats was "longevity" – the question of how long a copy of a game would remain accessible and playable. This is a significant issue for video games: Winget & Murray (2008) and McDonough et al. (2010) discuss the rapid loss of digital game content, pointing out that the risk of losing the artifact starts as soon as ten years after its creation. Both digital and physical advocates argued – sometimes quite vehemently – that their preferred format ensured a game's longevity, while the other would lead to unplayability in the foreseeable future.

Proponents of digital games typically cited the "breakability" of physical game formats. They noted that discs could break or become unusable through extensive use (such as discs becoming scratched to the point of unreadability), and had often experienced this firsthand; one respondent noted "I have had one too many bad experiences with faulty hardware and scratched game disks to put much stock in the medium" (ID: 921). Others were more concerned about potential future failures, and explained that they "didn't have to worry" about breaking digital games, suggesting that there was also a short-term benefit in lowered anxiety in addition to the long-term benefit of preservation (IDs: 1102, 1242, 1295, 1448). Digital games, by contrast, were seen as unbreakable and unlosable. One respondent explained that "I don't see the reason to buy a physical copy – it'll eventually be destroyed" (ID: 1025), implying that digital games were not similarly doomed. A few respondents also expressed worry about losing associated physical objects that were required to play the game, such as a CD key for PC games (ID: 1941).

Even the few digital advocates who identified potential problems were confident that there was a way to overcome them. On the possibility of losing access to games, one participant wrote "If Valve+Steam ever screws me over and takes away my digital games, I will just pirate them with a clear conscience," ultimately concluding "Digital is now. The future is here" (ID: 1944). This form of technological optimism – the idea that the newer digital format was solving all the failings of the older physical format – was widespread in these responses.

In contrast to the digital advocates, respondents favoring physical media tended to be cynical about the long-term preservation of their digital games. For instance, "I never trust anything in the 'cloud' to persist more than one generation," wrote one respondent (ID: 23). Many participants expressed fear that publishers or distributors would go out of business and take their associated digital licenses with them.

Others raised the possibility of companies intentionally taking their games away via an account ban, or of losing their account credentials needed to access the games:

"I don't like the idea that digital retailers might close shop or ban my account and leave me without my games." (ID: 1045)

"Physical. Because i[t] cannot be taken form [sic] me as easily if someone decides to no longer support there [sic] network or if my account is banned or destroyed and my property goes out the window without my say in the mater [sic] at all." (ID: 1374)

Some participants also raised concerns about losing their games in a "system crash" or other hardware failure (IDs: 473, 1999). Users referenced digital games that are "tied" to the hardware, like with the Nintendo Wii, and the possibility of losing them when the hardware broke or became obsolete (IDs: 1375, 1312).

However, like their digital advocates, many users wanted to be free of worry, and described a security in the tangibility of physical games. As one respondent noted:

"There is something about being able to actually hold a game in your hand, knowing that you can always put it in and it will play." (ID: 473)

Value and Transferability

Overall, respondents agreed that digital games were generally cheaper, and as a result affordability was given as a chief reason to prefer digital games. Frequent sales events (e.g., Steam sales, GOG sales (ID: 2139); Humble Bundle (ID: 1391); Amazon sales, and Green Man Gaming sales (ID: 1551)) made them even more affordable. Some also mentioned the added delivery cost associated with shipping physical games (e.g., IDs: 1359, 1332) in addition to the cost of the game itself as something they wanted to avoid.

Beyond the reduced cost at the end-user level, some described a reduced cost to society, as digital formats were seen as more ecologically friendly (e.g., "Digital produces less waste than physical games and cuts out middlemen, shipping costs, etc." (ID: 260)). The cost associated with the space necessary for storing the physical games was also noted (e.g., "Also, physical space is a premium" (ID: 537)). Some users explained that they prefer digital games because they are "free to play" (ID: 794), and also because they can try playing the demos before they purchase the game (e.g., "I can pirate them and try before I buy" (ID: 691)).

In particular, users residing outside of the United States noted the financial issues they experience with obtaining physical games with higher tax and price tags:

"Digital, because I live in Brazil, where import taxes almost double the cost of physical games. For instance, most AAA releases cost 200 Brazilian reals on retail for consoles, but only 100 through Steam..." (ID: 1462)

“Digital, because in my country video games are expensive and I must import it to pay a fair price.” (ID: 881)

Despite the general agreement that the purchase cost of digital games was lower, some respondents argued that physical games were cheaper overall, because they could be traded or resold; as one respondent explained:

“A large collection of physical games has value and can be sold. A digital purchase loses all value after it becomes attached to your account and cannot be sold or traded after purchase.” (ID: 475)

This sentiment was echoed by many physical advocates (e.g., IDs: 2178, 2034, 394). A few participants also noted that digital games were not necessarily cheaper in console marketplaces (e.g., IDs: 288, 1336) with one respondent also noting that “In practice, digital distribution without competition (see: Microsoft, Nintendo, Sony online stores) mean [sic] that prices never drop like they do for physical games” (ID: 1323). Additionally, the ability to borrow games from friends sometimes eliminated the need to buy the game at all (e.g., IDs: 1392, 2034). Other respondents mentioned the value added when a physical game goes out of print (ID: 2178), the ability to “try before you buy,” (ID: 1665), and the ability to easily “trade in” games to stores (ID: 1255). This sentiment was in line with the respondents of Toivonen & Sotomaa’s study, in which one-third of all respondents cited the lack of resalability as a reason they were hesitant to embrace downloadable games.

Physical games’ transferability also carries social benefits as it makes co-play, sharing, and trading easier, and also offers better consumer rights including renting and re-selling the games. As one respondent wrote:

“I like physical copies more mainly because of the share-ability of them. Digital copies are usually tied to an account/console and can't be shared. For as long as I can remember, I've shared games with my family and friends and have been introduced to many a wonderful game that way (first time I played FFX was from a rental copy).” (ID: 361)

Many other respondents discussed the act of curating and lending physical games to their friends and family, or discovering new games through these experiences. Some emphasized that shareable games were something they took with them rather than just “lent out” from home, such as a respondent who wrote “if I have the physical media I can take it to my sister's or loan it to my nephews, which is something you can't do with digital” (ID: 1691). An additional social benefit was that physical games could be displayed in a user’s home, making them a “conversation piece” (ID: 1418) and further facilitating the sharing process.

Yet despite not being physically transferable, many respondents emphasized the different aspect of portability of digital games as a point in their favor. For some, this was

simply a matter of transporting ephemeral data versus a physical object, noting that they were “easier to handle and use and transport” (ID: 2041; also IDs: 463, 1497). They also valued the networked nature of digital-native games. Specifically, the ability to access a game “from any device at any location” (ID: 2180) was emphasized repeatedly. The ease of transfer between devices was viewed as a boon for traveling (IDs: 236, 1713), moving homes (IDs: 133, 602), replacing hardware (IDs: 946, 1039) and general convenience. Some participants were so accustomed to this as to find the alternative simply unacceptable. As one respondent put it:

“[There is] no reason to have a physical copy of anything. With the ubiquity of high-speed internet access, I should be able to play whatever I own on any connected device.” (ID: 1894)

Nostalgia, Tangibility, and Aesthetics

Nostalgia was an important factor for participants preferring physical games. Many have grown up playing physical games and had fond memories of going to the brick and mortar stores and purchasing games as a child; sharing, trading and playing the games with their friends; and collecting them. Certain physical games attained the status of important artifacts to some participants, as they embody these special memories:

“Physical games. I still have my cartridge of Pokemon Blue and wouldn't change it for anything (not true but you get the point). If I had downloaded it somehow to my Gameboy, I wouldn't have that maker of dreams with me now. Call it whatever you want, nostalgia might be the best bet, but I just like to possess physically anything I spend money on. I forget most games but there are always those special ones that stick with you through the years and even stages of life and I wouldn't like to have it just on a computer or related to an account. I like them there when I need them.” (ID: 904)

For several participants, the physical games seemed to serve as heirlooms that preserved fond memories. People also mentioned the sense of ownership and importance of tangibility associated with the physical copies of the games. As one participant explained:

“Physical games, because digital games don't quite feel like your possession. You can store physical ones, order them, hold it in your hands, skim through the manual, enjoy the cover-art and box (or additional goodies). Seeing my games on my shelf makes me simply happy. The other main reason is that whenever you see the box, you are reminded of the game and how your life was when you were playing it (kinda like books you read) – it keeps lasting, happy memories. Digital games are much more easily forgotten.” (ID: 54)

A substantial number of participants saw the lack of an ability to interact with the game as a tangible, physical artifact and have a tactile experience with it as a big drawback of digital games. For many users, going to the store and obtaining the game as a tangible information object was an enjoyable experience in and of itself (e.g., “I do still become really giddy whenever I hold a new game in hand that I've been hyped as all hell to play” (ID: 1635)), and that excitement of acquiring a new game and preparing to play the game seemed to diminish substantially when they were simply clicking the button and downloading the game (e.g., “I prefer physical games because it is tangible and I can hold it. I also like to unwrap it. It's not the same waiting on a download screen” (ID: 1971)). Participants' need for this sense of tangibility was also partly satisfied by the additional materials accompanying the “collector's” version of physical games, such as art books, special cases, and alternate game covers.

Many participants also felt that there was an important connection between physical objects and a sense of ownership. Physicality of the item made these games have more immediate “presence” compared to digital games. Possession of physical items was regarded as a way to “prove” their ownership (e.g., “I like my physical media because it is a tangible badge of ownership that can be displayed on a shelf” (ID: 1207)). Physical games also allowed these users to be able to more easily display and “show off” their collection (e.g., “I have something physical to show for my money” (ID: 2062); “I have a hard copy, and can have a visual collection in my room to marvel at” (ID: 1430)).

This sense of nostalgia, tangibility, and ownership seems to be a powerful and compelling feeling, as many participants still opted for physical copies of games despite clearly understanding the benefits and convenience of digital formats. This group of respondents seemed to mirror the behavior of music collectors studied in Brown et al. (2001), who noted that “some enthusiasts felt strongly about the pleasure of looking through the spines and selecting a CD to play” (p. 72). Along these same lines, some participants in our study discussed the whole process of obtaining and playing the game as sort of a “ritual” as they build up their excitement and anticipation for playing the new game:

“I enjoy the ‘ritual’ of getting the game, placing the disc/cart/what-have-you into the console and starting it up.” (ID: 1493)

“Mostly for the nostalgic feeling of inserting the game into the Console. There is anticipation because your game ‘loads’, connects. There is a physicality to the experience other than just grabbing your remote.” (ID: 1998)

“I like the action of putting a disc in the console. It's like the disc is a key and I'm unlocking the game inside.” (ID: 765)

These participants also anticipated long-term benefits of possessing the game in physical form. They mentioned “collect(ing) them for future experiences” (ID: 1420) and talked about “enjoy(ing) being able to share my favorite games and introduce them to people who may miss out otherwise” (ID: 380).

Physical games were also attractive to many users because the physical package included materials they appreciated and wanted to collect, such as box art, disc art, and manuals (which also allow for easy reference), and this was especially the case for special or limited collections including special artwork/artbooks, figurines, maps, posters, and soundtrack CDs. The games collected served as a visual reminder of their existence, and people enjoyed watching their game collections grow over time.

“I prefer physical games because I enjoy having a physical collection to look at and physically touch. Nice artwork, a colorful and in depth instruction manual all make it better.” (ID: 1043)

“Physical because it makes the game seem like its own unique entity and this has an aesthetic appeal to me.” (ID: 500)

“I believe owning a physical copy is much more valued for the player. Not only does it help visualize the user's library, it legitimizes video games as any other form of entertainment, allows for trading and renting, and is a conversation piece for friends and family.” (ID:1418)

The importance of tangibility and “collecting” to the physical advocates in our survey support Toivonen & Sotomaa's findings (2010), in which the majority of respondents that preferred physical games explained that they “appreciate the opportunity to look and touch the game cartridges. This gives them a concrete feeling of ownership, different from the one connected to digital copies” (p. 204).

Storage and Organization

The issues related to storing and organizing video games came up as reasons for preferring both digital and physical formats. The storage of games was a common issue for both types of participants: for physical games, participants were concerned with having to deal with their game collection cluttering their space, and with digital games, they were mainly worried about the limited memory available in their console hard drives.

“I don't have a lot of computer storage, so too many large digital games is [sic] just as ‘crowded’ as too many physical games.” (ID: 251)

“As with games needing to be installed on the consoles HDD, they take up large amounts of space. I prefer the convenience of being able to delete game data but still have the physical copy present if I ever feel like revisiting the game later and not have to download the ENTIRE game, rather than just the data needed to run it off the disc.” (ID: 840)

Participants who preferred physical games based on the organization/storage aspects primarily discussed the ease of browsing and display of the collection. Being able to curate and display the collection exactly in the way they wanted was a big appeal to these users. On the other hand, participants who preferred digital games based on storage issues noted that with moving and living space increasingly scarce, reducing the clutter was important, especially for game collectors who had large collections consisting of hundreds of games. Saving the physical space by choosing digital games also meant that there is more room for other media such as books for some users (e.g., ID: 1748). Interestingly, saving face was also mentioned as a reason, as one of the users commented how digital games keep oneself from looking like a hoarder (ID: 1529).

In addition to just needing more space to store physical games, some users also mentioned additional organization, management, and access issues that can be caused when the stored collection is not well organized. Participants talked about difficulties in remembering where they have put their old games (ID: 2101) and having to dig through their collection to find a disc in order to play a specific game (IDs: 1968, 1961). Participants also noted that a digital game collection is faster to browse (ID: 1640) and easier to see the entire library (ID: 506). These participants appreciated the fact that all digital games are automatically organized by and accessed through the game distributor's interface (such as Steam). Some discussed their issues in remembering and keeping track of the games they actually own (IDs: 1202, 2083), commented on how they do not have to worry about misplacing or losing digital games when they move (IDs: 158, 1074), and liked that there is no clean up required (ID: 1432).

Content and Hardware

Participants sometimes referenced the actual game content as a reason that they preferred digital games over physical games. This typically arose out of the perception that certain types of games were predominantly or exclusively available in one format. Sometimes, this was a matter of genre, as with the respondent who noted that "[There is] more variety of puzzle games digitally" (ID: 113), or another who explained a preference for physical media with the comment "I prefer sport themed games" (ID: 249). However, it appeared that these game genres were not so much innately tied to the format as methods of different types of game production: independent games tend to be digital, and mainstream/blockbuster games tend to be physical, particularly on game consoles.

Digital advocates typically cited a preference for independent games. One respondent explained that "digital let me have easy access to a large number of options that would otherwise be inaccessible to me, including to independent developers" (ID: 344). Another noted that "you can find a lot of niche and indie games way easier in digital form" (ID: 427).

Respondents who preferred physical formats suggest that physical games tended to have higher production quality, with the general sense that not only were there better graphics but a greater amount of content (IDs: 302, 1116, 2140). One respondent went so far as to say "Physical games tend to be larger productions. Most games only available for download tend to be what one would end up with after completing an SDL tutorial" (ID: 65).

However, most respondents that cited content as a reason to prefer physical games over digital games made reference to enjoying games that simply do not exist as digital downloads, particularly older titles that predate digital formats (IDs: 60, 603, 2003). As one noted, "The large disparity in my physical vs digital game use is really down to the fact I enjoy playing older games that are limited to physical copies only" (ID: 374). However, another respondent also noted a shift towards greater digital availability of older titles particularly with older PC games ("[It was] hard to find digital copies of 5 1/4" D&D gold box games 5 years ago, but very common now as re-releases or via GOG, Abandonware sites, etc." (ID: 215)).

Many participants also explained that their format preferences were dictated by the hardware they used to play games, as with the participant who stated that "I use Macs and iOS products. There are no physical games to be purchased for either platform anymore. They simply don't exist" (ID: 1634). While computers' increasingly digital-only nature was referenced by a few other respondents, most explicitly referred to playing games on tablets and smartphones that did not support physical media (IDs: 498, 1612, 2154).

On a similar note, a few respondents referred to older consoles that were incapable of playing digital games (e.g., "I own older consoles, and they generally can't download games" (ID: 1340). However, such responses were rare – either because few respondents predominantly played older consoles, or because other factors had greater weight on their preferences.

CONCLUSION AND FUTURE WORK

In general, respondents tended to provide different reasons for preferring physical and digital games. Advocates of digital games typically valued ease of access, ease of purchasing, and portability between devices, whereas those who preferred physical games generally valued the ability to share and resell games, the paraphernalia and collectibles that came with physical games, and the aesthetic and tangible qualities of the physical object. In short, respondents were not necessarily disagreeing with each other; they just valued different aspects of the gaming experience. Some exceptions to this pattern were aspects like storage and longevity, where participants were focusing on different aspects related to the issues, or exhibited different opinions based on their prediction of what is likely to happen in the future.

Many respondents who preferred physical games tended to value the feeling of being in control of their media – feeling a stronger sense of ownership, being able to curate and present their own collection in the way that makes sense to them, and being able to share, resell, and trade-in games. How to satisfy these needs in a new distribution model with digital games will be an ongoing challenge for game content providers. This is significant, as more and more content providers advocate for distribution models where they sell the “access” to the content (through subscription-based or streaming models) rather than the media objects themselves. How do we enable users to feel as if they completely “own” the media without the physical tangibility of the objects and possibly even without the concept of “personal collection”? Additionally, part of the experience users seemed to value was not directly based on their direct media consumption experience (i.e., playing the game) but based on other interactions surrounding the media object (e.g., purchasing the game, organizing the collection, showing the collection to friends). Are there ways to improve this kind of experience with digital media objects?

The findings suggest a number of implications for game content providers and libraries:

1) While librarians continue to challenge the “access instead of ownership” model proposed by book and journal publishers, the rapid shift to an access model for video games has gone largely uncontested. What our study shows are users’ continuing concerns over DRM, online access requirements, and game licenses tied to companies that may or may not exist in the future. Information professionals must contribute to and amplify a critical conversation about the disappearance of game ownership if we want to ensure access to these titles in the future. In addition, any measures to help ensure or increase the sense of the permanency of access to games in content providers or libraries (e.g., permanent ownership of limited number of games in the cloud collection, legal agreement on protecting users’ access to games and/or game data in the event the corporate body dissolves) would help alleviate some of the fears and hesitancy users have for embracing digital games and access-based distribution models.

2) While digital games afford many conveniences, a significant number of respondents found that they failed to capture the same experience as physical games. A fruitful area of future study would be to examine how digital games, and digital game platforms, can embody the positive aspects of the physical gaming experience. Implementing stronger social features may help and many attempts to employ them have been made for a variety of consoles (like Friends feature in Steam or Dashboard in Xbox One which allow users to browse other people’s collection or gaming history). However, our findings suggest that features like digital loaning of games to friends and digital resale or trading, which are mostly unexplored, could possibly make a huge impact in compensating for the loss of user-

perceived benefits (e.g., ownership, value) of using physical formats. Integrated index of games purchased and/or owned across multiple platforms can also be beneficial for tracking games and avoiding unintentional multiple purchases of the same game.

3) The widespread concern about the longevity of video games suggests a demand for institutions dedicated to game preservation. Academic libraries in particular have historically served key roles in preserving our cultural legacy, but as of yet only a few academic libraries have amassed any significant video game holdings, or undertaken preservation efforts. Further research on best practices in game preservation, combined with implementation of these practices by institutions dedicated to cultural preservation, will be necessary if respondents’ fears are to be allayed.

4) The widespread disagreement over which game formats give the best chances for longevity suggest a lack of readily available information on how long game players can expect to access their games. Given that our literature review found little research on this question, it seems that future efforts must both uncover the answers to these questions and find ways to educate consumers about the results.

Several users in our study explained their preference for physical formats transferred to other media including books, music, and movies (e.g., “I like having them on my shelf, very much like books” (ID: 1740); “Though I don’t make a collection out of games per se, I find richness in owning an actual, physical game. I’m like this with movies and music as well” (ID: 1898)). In our future work, we plan to explore how users perceive the values of physical versus digital formats for other kinds of media, including music and films, and how exactly those perceptions transfer across different media. We want to identify and comparatively analyze the reasons for format preference and investigate how those preferences may affect their adoption of either format in different media as well as varying media ownership and consumption models.

ACKNOWLEDGMENTS

The authors thank everyone who participated in the survey and helped recruit participants, as well as the students in the INFX 536 course for their contribution in testing the survey questions. This research is supported by the University of Washington Office of Research.

REFERENCES

- Bauin, S., & Rothman, H. (1992). “Impact” of journals as proxies for citation counts. In P. Weingart, R. Sehringer, & M. Winterhager (Eds.), *Representations of science and technology* (pp. 225-239). Leiden: DSWO Press.
- Bockstedt, J., Kauffman, R. J., & Riggins, F. J. (2005). The move to artist-led online music distribution: Explaining structural changes in the digital music market. In *Proceedings of the 38th Annual Hawaii International Conference on System Sciences* (p. 180.1). IEEE.

- Brown, B., Geelhoed, E., & Sellen, A. (n.d.). The Use of Conventional and New Music Media: Implications for Future Technologies. In *Human Computer Interaction INTERACT '01* (pp. 67–75).
- DiChristopher, T. (2015). Digital gaming sales jump 11% to \$5.4B in Sept: Report. CNBC. <http://www.cnbc.com/2015/10/22/digital-gaming-sales-jump-11-to-54b-in-sept-report.html>
- Hayles, N. K. (2012). *How We Think: Digital Media and Contemporary Technogenesis*. Univ. of Chicago Press.
- Hill, C. E., Knox, S., Thompson, B. J., Williams, E. N., & Hess, S. A. (2005). Consensual qualitative research: an update. *Journal of Counseling Psychology, 52*(2), 196-205.
- Hoppe, K., Ammersbach, K., Lutes-Schaab, B., & Zinssmeister, G. (1991). EXPRESS: An experimental interface for factual information retrieval. In J.-L. Vidick (Ed.), *Proceedings of the 13th International Conference on Research and Development in Information Retrieval (ACM SIGIR '91)* (pp. 63-81). Brussels: ACM.
- International Federation of the Phonographic Industry. (2015). IFPI Digital Music Report 2015: Charting the Path to Sustainable Growth. <http://www.ifpi.org/downloads/Digital-Music-Report-2015.pdf>
- Jöckela, S., Willa, A., & Schwarzer, F. (2015). Participatory media culture and digital online distribution—reconfiguring the value chain in the computer game industry. *International Journal on Media Management, 10*(3), 102-111.
- Kinnally, W., Lacayo, A., McClung, S., & Sapolsky, B. (2008). Getting up on the download: college students' motivations for acquiring music via the web. *New Media & Society, 10*(6), 893–913.
- Kling, R. & Elliott, M. (1994). Digital library design for organizational usability. *ACM SIGOIS Bulletin – Special issue on workshop write-ups and position papers from CSCW'94, 15*(2), 59-70.
- Laird, S. (2012). How Streaming Video is Killing the DVD. Mashable. <http://mashable.com/2012/04/20/streaming-video-dvd-infographic>
- Lee, J. H., Clarke, R. I., & Kim, Y.-S. (2015). Video game information needs and game organization: differences by sex and age. *Information Research, 20*(3). <http://www.informationr.net/ir/20-3/paper683.html>
- Lee, J. H., Clarke, R., I., & Perti, A. (2015). Empirical evaluation of metadata for video games and interactive media. *Journal of the Association for Information Science and Technology, 66*(12), 2609-2625.
- Mareike, J. (2016). Is this TVIV? On Netflix, TVIII and binge-watching. *New Media & Society 18*(2), 257-273.
- Mayers, K., Koomey, J., Hall, R., Bauer, M., France, C., & Webb, A. (2014). The carbon footprint of games distribution. *Journal of Industrial Ecology, 19*(3), 402-415.
- McCourt, T. (2005). Collecting music in the digital realm. *Popular Music and Society, 28*(2), 249-252.
- McDonough, J. P., Olendorf, R. Kirschenbaum, M., Kraus, K., Reside, D., Donahue, R.,...Rojo, S. (2010). Preserving Virtual Worlds Final Report. Retrieved June 22, 2016 from <https://www.ideals.illinois.edu/handle/2142/17097>
- Moore, C. L. (2015). Digital games distribution: the presence of the past and the future of obsolescence. *M/C Journal, 12*(3). <http://journal.media-culture.org.au/index.php/mcjournal/article/viewArticle/166>
- O'Connor, A. (2015). Digital disturbance: Desura owner files for bankruptcy. <https://www.rockpapershotgun.com/2015/06/05/desura-bankruptcy-bad-juju-games/>
- Percy, J. (2013). E-book lending: the challenges facing interlibrary loan. *Interlending & Document Supply, 41*(2), 43–47.
- Pullen, J. P. (2015). 5 Reasons Streaming is Making DVDs Extinct. TIME magazine. Retrieved February 2, 2016 from <http://time.com/3921019/streaming-dvds/>
- Sonnenwald, D. H. (Ed.). (2016). *Theory Development in the Information Sciences*. Austin, TX: UT Press.
- Styvén, M. (2010). The need to touch: exploring the link between music involvement and tangibility preference. *Journal of Business Research, 63*(9-10), 1088-1094.
- Toivonen, S., & Sotamaa, O. (2010). Digital distribution of games: the players' perspective. In *Proceedings of the International Academic Conference on the Future of Game Design and Technology* (pp. 199–206). ACM.
- Tyni, H., & Sotamaa, O. (2011). Extended or exhausted: how console DLC keeps the player on the rail. In *Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments* (pp. 311–313). ACM.
- Vaccaro, A. (2014). Why it's difficult for your library to lend ebooks. <http://www.boston.com/news/technology/2014/06/27/why-its-difficult-for-your-library-to-lend-ebooks>
- Waldner, F., Zisfkovits, M., & Heidenberger, K. (2015). Are service-based business models of the video game industry blueprints for the music industry? *International Journal of Services, Economics and Management, 5*(1), 5-20.
- Welsh, Oli (2016). “The Kinect Wind-down Continues as Xbox Fitness Is Retired.” Eurogamer.net. <http://www.eurogamer.net/articles/2016-06-28-the-kinect-wind-down-continues-as-xbox-fitness-is-retired>.
- Winget, M., & Murray, C. (2008). Collecting and preserving videogames and their related materials: a review of current practice, game-related archives, and research projects. *Proceedings of the American Society for Information Science and Technology, 45*(1), 1-9.