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Abstract

This article explores the growing importance of live streaming, specifically on website and platform Twitch.tv, to the games industry. We focus not on live streaming as a form of media production and consumption, but instead explore its newly central role in the contemporary political economy of the whole video games ecosystem. We explore three cases: streaming newly released games and the attendant role of streaming in informing consumer choice; the visibility and added lifespan that streaming is affording to independent and niche games and older games; and the live streaming of the creation of games, shedding light on the games industry and subverting ordinarily expensive or highly competitive game-design courses, training and employment paths. To do so, we draw on empirical data from offline and online fieldwork, including 100 qualitative interviews with professional live-streamers, offline ethnography at live-streaming events, and online ethnography and observation of Twitch streams. The article concludes that live streaming is a major new force in the games industry, creating new links between developers and influencers and shifting our expectations of game play and game design, and is consequently a platform whose major structural effects are only now beginning to be understood.

Keywords digital economy, games industry, game studies, labour, live streaming, reviewing, video games

Introduction

Twitch is a live streaming platform with a strong focus on the broadcast and viewing of video game content. In the last 5 years, its visibility and impact have rapidly grown to a point where it has become a major force in the games industry and increasingly in the global media ecosystem as a whole. For example, in 2016, there were 292 billion total minutes watched and 2.2 million unique streamers (Twitch, 2016) who broadcast their activities on the platform, followed by over 350 billion minutes in 2017 (Twitch, 2017). The success of *Twitch* is also clearly signalled by its recent purchase for almost a billion dollars by *Amazon*, and its position as roughly the 100th most viewed website, of any sort, in the world. The presence of *Twitch* is not just affecting the play nor spectating of games, however, but also their production, marketing and reviewing. For example, when the 2015 game *Rocket League* was launched on *Twitch*, its unusual combination of football (or soccer) played with cars instead of human sportspeople proved strikingly and unexpectedly popular on the platform. In the first month after launch, *Rocket League* went from the 165th most watched game to the top 5, resulting in over 5 million download sales (Twitch, 2015). It has been noted by commentators that 'what *Rocket League* did in the span of a month is quite remarkable' (George, 2015), bringing an unknown game into the limelight at remarkable speed; this kind of direct marketing strategy, broadcasting straight to game consumers and *only* game consumers, would have been unheard of before *Twitch*. As Jeremy Dunham, the Vice President of the game's publisher has explained, '*Twitch* and its streamers have been an instrumental part of our success since we launched' (quoted in Purcell, 2016). That success includes nominations for over 100 Game of the Year awards and reaching 'a global audience of over 12 million players' (Gaudiosi, 2016). Building on this, the publisher is now working closely in partnership with *Twitch* to launch the *Rocket League* Championship series (Purcell, 2016). The example of *Rocket League* – to which could be added titles like *H1Z1* (2015) or *PlayerUnknown's Battlegrounds* (2017) that have achieved impressive sales on

the back of the platform – show how the success of contemporary games increasingly relies on marketing through a live streaming platform like *Twitch*.

In this article, we therefore ask, how is *Twitch* changing the games industry? By 'the games industry', we mean the global technological sector concerned with the 'conception, development and release of unique, highly creative products, namely video games' (Autier and Picq, 2005), drawing on a 'range of specialisms including game production, game design, game development, level design, audio design, art and testing' (Green et al., 2007). It has for some time been 'one of the fastest growing industries worldwide' (Teipen, 2008), consisting primarily of an 'oligopoly of hardware manufacturers and a dispersed population of game developers and publishers' (Peltoniemi, 2008), as well as a significant 'indie games' component, consisting of generally smaller businesses and products often seen as more creative than those developed by the larger companies (Crogan, 2018). Games are also produced in other contexts, such as by individual fans and enthusiasts (e.g. Deller, 2014), but these are rarely conceived as being a part of the games *industry* as a formal unit. As such, we focus not on live streaming as media production and consumption but instead explore its newly central role in the contemporary political economy of the whole video games ecosystem. We explore three cases: streaming newly released games and the attendant role of streaming in offering information and informing consumer choice; the visibility that streaming is affording to both smaller new releases, independent and niche games, and older games; and the live streaming of the creation of games, subverting ordinarily expensive, lengthy or highly competitive game-design courses, training and traditional paths of employment. This study is important due to not just the significant size and impact of the platform within the contemporary gaming ecosystem but the large number of game industry elements that *Twitch* – as we show – is affecting. Few if any parts of the sector have remained untouched by its effects. As such, this article is intended to provide a comprehensive overview of what we propose are the three most significant effects of live streaming on the games industry, and those who move within it, and situate these changes within the broader dynamics of the contemporary video games industry.

Scholarship on Twitch

The consumption of digital content on *Twitch* needs first to be understood within the broader dynamics taking place within media. For example, print media and linear television continue to decline, particularly sharply within the younger age brackets. For example, for the 11–24 age group, only half of all video content is now consumed via television (Deloitte, 2015: 4). Similarly, key indicators in the United States and the United Kingdom are signalling a decline in television consumption, with increases in 'cord cutters' and 'cord nevers' (Littleton, 2015) and falling rates of television licenses (Joseph, 2015), respectively. In this context, the emergence of *Twitch* represents a media phenomenon through which 'anyone can become a TV provider' (Pires and Simon, 2015: 225), although less is presently understood about why people choose to watch others stream their activities online (Sjöblom and Hamari, 2016). Spectatorship *itself* is not a novel aspect of video game play, taking into account the role of arcades or other forms of shared play (Taylor, 2016); what is novel is the development of this into a 'protoindustry of social media entertainment' (Cunningham and Craig, 2016: 5412) – a new form of broadcast production and consumption, and the one we focus on in this article.

The most visible actors in the phenomenon of streaming are the 'streamers' themselves. The labour involved in streaming is analogous to Kücklich's (2005) notion of 'playbor', relying also on elements of 'free labour' (Terranova, 2004) that are in many ways much closer to play than work, and yet can be reconstituted to yield financial gain. The process of streaming the play of video games has some similarity with the 'modding' communities around games (Postigo, 2007; Sotamaa, 2010) – which entail the alteration of game content by fans. Such dynamics are also at work with streaming, albeit

altering the *consumption* of video games rather than the direct modification of *code*. This has accelerated as new career paths and ways of monetising the streaming process have facilitated the emergence of professional streamers (Johnson and Woodcock, 2017), many of whom are from demographics that traditionally struggle to find opportunities in the digital economy (Johnson, 2018). These professional and aspiring-professional streamers are now forming 'communities of practice' (Burroughs and Rama, 2015: 3), making *Twitch* a kind of 'virtual third place […] in which informal communities emerge, socialize, and participate' (Hamilton et al., 2014: 1315). These communities comprise 'gamer-spectators', encompassing both 'gamers, game casters, and gamecast viewers' (Burroughs and Rama, 2015: 2). In the process, viewers communicate both with broadcasters and each other in real time (Nematzadeh et al., 2016), leading Churchill and Xu (2016: 223) to argue that streaming has become 'more than just an entertainment medium; it is the home of the largest gaming community in history'.

The implications of such a large gaming community for the game industry are multiple. However, we can immediately see several connections between the growth of live streaming and other existing trends in the games industry. For example, the rise of investment and labour costs in the mainstream, blockbuster-title, 'triple-A' or 'AAA' games industry (Dyer-Witheford and de Peuter, 2009: 4) has led to a number of shifts in games production. The dominance of publishers in the value chain has increased the importance of digital storefronts and the mediators who control the placement of products within them (Toivonen and Sotamaa, 2010). This has resulted in 'power asymmetries' emerging, particularly with greater 'market pressures around cost and flexibility' (Thompson et al., 2015: 7). These pressures have resulted in marked changes, such as the move signalled by a Ubisoft executive who explained that their 'business model has changed' to utilising sequels rather than developing new intellectual property (quoted in Martin, 2010). Conversely, independent game developers have been able to use crowdfunding to explore new ways to fund development and reach audiences, something that can be facilitated by promotion on platforms like *Twitch*. However, perhaps the clearest example of how performative play has reshaped the games industry is with Esports. Professional gaming has proven to be a successful method to encourage engagement and the growth of a player base, as well as increasing profits – in some cases dramatically – in the video games industry. Shifts of these sorts – towards digital storefronts, towards a market that responds to more flexible game production and consumption, towards crowdfunding, towards a new emphasis on the role of game audiences, and towards Esports and its attendant spectatorship – each suggest one piece in the rise of live streaming and its quite sudden, yet now fundamental, role within the games sector. In turn, therefore, understanding *Twitch* and its effects on the games industry will shed light upon a range of other concerns, forming a contribution to the understanding of the video games industry.

Methodology

This article takes the form of a discussion inspired by data gathered through over 100 in-depth semi-structured interviews with professional and semi-professional live streamers, alongside extensive empirical data from both online and offline ethnographic fieldwork, and study of third-party literature surrounding *Twitch* and live streaming as a whole. In the first case, we have interviewed individuals who are either 'professional' streamers, by which we mean *Twitch* streaming and other monetisation associated with it (Johnson and Woodcock, in press) forms their sole income or the overwhelming majority of it, or semi-professional streamers, by which we mean their activities on and around the platform constitute part, but not the whole, or their income. These interviews were secured at gaming and streaming events in the United States, United Kingdom, Germany and Poland in 2016, 2017 and 2018, during which the authors sought to maximise the demographic variety in the streamers interviewed in order to capture as wide a picture of contemporary streaming, and its diversity and complexities, as possible. In the second case, at these events and others we have

conducted extensive ethnographic observation totalling several hundred hours, in addition to over 200 hours of observation on 200 *Twitch* channels themselves, again with a remit to maximise the diversity of both content and streamer during this study – but with a focus on the dominant actors on the platform, who shape what *Twitch* is most strongly associated with, where the most profits can be made, what other streamers aspire to and so forth. In the third case, we draw on a number of journalistic pieces, games commentary pieces, gaming news and reports, which discuss *Twitch* and live streaming: given the rapid expanse of both the platform and the practice, these are highly numerous and shed light on the effects *Twitch* is having beyond the platform itself. Collectively, these three sources of data offer a rich foundation for understanding how *Twitch* is changing the games industry.

Streaming as games reviewing and advertising

We begin by exploring the new role of live streaming as a form of games reviewing and consequently a form of game advertising for game developers and publishers. The traditional paradigm of video game reviewing (de Vaan et al., 2015; Livingston et al., 2011) entails a monologue offered to the consumer. This takes two forms, as either a written review or a video review. In the written review, the game journalist will discuss as much as they can about the game within the word count they have available, including a number of screenshots that portray especially interesting or visually striking parts of the game. As with cinema and any other area of cultural production, the actual text from two reviewers who otherwise agree on the *quality* of the medial artefact – for example, a score of 8 out of 10 – can differ significantly, with one reviewer emphasising graphical and sound quality, for example, while another praises the multiplayer options. Reading multiple reviews will therefore give a broader appraisal of the game in question, but one is nevertheless beholden to the particular interests and backgrounds of reviewers. This is also apparent in games with multiple diverging paths, where some reviewers will have experienced one part, and other reviewers another; reading multiple reviews gives a sense of the different forms gameplay might take.

In a video review, meanwhile, the player considering the purchase of the game is given a far greater range of audiovisual content to inform their decision, but – generally – far less written (spoken) content. A video review will show recorded game content behind the spoken reflections of the reviewer which serve as a 'voiceover', with the two often designed to synchronise and inform one another. Nevertheless, this remains a monologue where the reviewer selects the footage they deem to be of value, and the footage will inevitably be a 'highlights reel' disconnected from the actual flow of gameplay. In both cases, therefore, traditional game reviewing is focused on relating particular moments of the game to the consumer (as selected by the reviewer), with the potential-buyer being given a set of observations or disconnected clips linked only by the reviewer's own personal reasoning or preferences.

However, *Twitch* has led to an entirely new spectacle of games 'reviewing' – one where the potential buyer tunes in to a streamer playing and commentating over the game, engaging in a review which is both of vastly greater length and detail, and which fundamentally takes the form of a *dialogue*. As a game reviewer explained, the first time they tried reviewing on *Twitch*, he 'fed off their enthusiasm and invited viewers to essentially guide the stream […] lending a layer of interactivity to the experience' (Evangelho, 2014). This led the reviewer to compare the experience to that of the game 'demo' – a generally free, downloadable version of a game which gives access to a small portion of the game's overall content. Although once extremely common, demos have become increasingly uncommon in the industry as a result of numerous structural changes in the sector beyond the scope of this article. Thus, Evangelho (2014) argued that 'Twitch is the new game demo', although arguably now mediated via the streamer, rather than a player's own actions.

When one wishes to obtain information about a game, one might consider purchasing, the discerning consumer now needs to look no further than *Twitch*, quickly searching for a streamer who is currently broadcasting that game and settling in to watch their stream. Any game that is at least remotely recent and remotely popular is bound to be streamed actively by at least one of *Twitch*'s 2 million regular broadcasters. Tuning into these broadcasts allows the viewer to learn about the game in greater *detail* – although potentially lesser *scope* – than a video or written review. By this, we mean that the player witnesses the game actually being played, instead of being given a visual or video summation of highlights: the viewer thereby sees the streamer's failures and successes, the processes by which they figure out what the game expects of them and so forth.

In turn, as well as offering this greater detail of the area of the game the streamer is currently playing (albeit without a 'big picture' impression of the game unless the viewer watches for quite some time), the interactive nature of *Twitch* also marks a significant shift in the nature of game 'reviewing' as an activity. Viewers of live streams on *Twitch* are able to send textual messages to the streamer (Ford et al., 2017; Nematzadeh et al., 2016), who in most streams will read them, respond to them and potentially even adjust their behaviour in order to respond to a viewer suggestion: 'Could you look in that building?', 'What was the previous level like?' and so forth. This enables the viewer, without purchasing the game, to drive some of the nature of their own personalised review, asking the streamer questions about the game and shaping what areas of the game the streamer explores, how they might tackle them and so forth. This means that through interaction with viewers (who might be considering a purchase), the games reviewer adapts and alters their practice and creates a unique review that differs and evolves as different viewers enter and exit the stream. The potential buyer is therefore treated to a review that is, in some small part, tailored either to them specifically or to them as a representative of other viewers who might be asking similar questions to the ones a given viewer might wish to ask.

As well as transforming the volume of information given to a viewer and the 'pace' at which that information is delivered, streaming of newly released games has become a source of big events for broadcasters and viewers alike. Upon release of a new major title, a significant portion of the most popular 'variety' streamers will always be found playing that game, often for several days or weeks after release (although the very first day remains the most important). For many such streamers, their personal records for viewership numbers often come on these kinds of days, when both their traditional viewing public, and new viewers interested in the game in question, congregate on their channel to experience this new form of game review. In some cases, new streamers also rise to visibility on the back of a specific new games whose broadcast they partly, or in some cases almost fully, monopolise; particular streamers have risen to rapid success on the back of games such as *Warframe* (2013), *Super Mario Maker* (2015) and *Overwatch* (2016), often having been broadcasting these games since the day they were released. In some cases, developers and publishers offer deals to highly visible streamers, with payment in exchange for the broadcasting of their newly released game. These deals are both facilitated by *Twitch* (Twitch Advertising, 2018) or can be independently arranged.

As such, our respondents were very clear on the fact that *Twitch* is consequently now serving a vital role for the wider games sector: for example, R1 strikingly told us that during 'every single stream, we are advertising the game' (cf. Clark, 2018). They acknowledged this perspective was 'cynical', but 'if a big game streamer streamers a game, that's amazing advertising, *because you see the game rather than reading the review*' (emphasis ours). They argued that a traditional review is 'compromised' because it only entails what is shown in the review, whereas a live streamer can talk with viewers – which is to say, potential buyers – in order to help them consider a purchase, or inform them more about the game. This newfound importance of *Twitch* is shown quite clearly when we consider how streamers are taking advantage of the situation to their *own* benefit, rather

than solely that of the games industry. For example, R2 told us that they had 'picked up' some sponsored streams (Cocke, 2018; Pullen, 2018), including from *Nintendo*, a collaboration with an 'ordinary gamer' unimaginable in a pre-*Twitch* era. R3 explained that this was because companies are looking to 'put their name and brand on everything they can, [in order to] open up the eyes [*sic*] and get a more diverse crowd of people, and [ensure] their name gets out there'.

As such, streamers – aware of this change in the games ecosystem – now find themselves with unexpected amounts of power and influence that game companies are keen to tap into. When it came to streamers' expectations, R2 explained that if companies approach a streamer who is already playing a game and expresses a desire to sponsor them, 'as long as the conditions weren't ridiculous' – and the company 'respect[s]' that streamers will only be willing to recommend particular products – this would be acceptable. Similarly, R4 told us that game companies have 'gone out of their way to make things more comfortable' for streamers, making it easier for streamers to access their games, again demonstrating how the games industry recognises the importance of this market and that live streamers are now, suddenly, vital influencers in the game ecosystem. This has been facilitated by the growth of third-party organisations like WeHype (2018) that connect streamers and brands. This also generates a particular feeling in streamers: 'when companies like Nintendo, EA, and Microsoft want to work with me', explained R1, 'I feel like I'm part of the game industry'. We therefore see the rapid emergence of a mutually beneficial relationship, with both the savviest streamers and the savviest game companies moving quickly to secure the benefits of this new mutualism.

However, the role of the developers and publishers of video games in this shift is presently a site of contestation, complicating the nascent role of live streamers as video game reviewers. As we have noted, the amount of the game shown to the potential consumer is relatively small in video reviews, and even smaller in written reviews; in a live-streamed 'review', however, the dedicated viewer could potentially tune into a stream when the streamer begins playing a new game, watch the *entire game* being played, and then feel satisfied that – having seen the complete game – there is no longer any pressing need to make a purchase of the game. Although they have not played it themselves, such viewers are responding to the simultaneous expansion in game-playing options and shrinking of the potential time for leisure activity (Johnson and Luo, 2017). This hypothetical viewer has still certainly got *some* of the value from the game without handing over any money whatsoever to the developers in recompense for that experience. As a result, there is now a noticeable contrast between game developers who actively encourage the streaming of their games and developers who believe live streaming will reduce sales. This is raising new questions about intellectual property and how gameplay can be shared (Taylor, 2018), which will continue to evolve and be contested in the coming years.

This politicisation of games reviewing when it comes to the volume and form of content shown to the viewer via live streaming is a new development, but fits into other ongoing political contests surrounding the practice. For example, a number of games publishers have developed 'black lists' of reviewers who cannot be 'counted on' to provide positive reviews for big-name titles, preferring to only give review copies to well-known, tame reviewers (Sterling, 2016; Yin-Poole, 2017). This trend has led to a significant backlash online when it comes to the ubiquitous high reviews given to major blockbuster titles irrespective of their actual quality, and a small but steady growth of independent reviews who trade off their perceived neutrality and unwillingness to become complicit in this system. For example, major game reviewer *Kotaku* was supposedly blacklisted by *Bethesda* and *Ubisoft* for announcing previously secret games, preventing any further access to games (Totilo, 2015). This is an extension of reviewing politics in an increasingly industrialised, competitive, over-saturated industry. Game publishers have also brought forward the time at which review copies are handed out to reviewers, distributing review copies only a few days before, or sometimes even after, the game is itself released; the rationale is that this denies potential consumers access to potentially

negative reviews, allowing the marketing of the game, rather than the reviews of that game, to do the only speaking on behalf of the final product. As such, game reviewing has always been a political contest between the needs of a publisher, the needs of a reviewer and the needs of a potential consumer, which do not overlap; the contest over live streaming reviewing should therefore be understood within this context. At present, the number of game companies who eschew the potential benefits of streaming – fearing, instead, the loss of sales – is minimal, but nevertheless shows that a shift in one element of the games industry ecosystem (reviewing) is having a significant knock-on effect elsewhere (production and marketing) and one which might become increasingly important in the coming years.

Having said this, it must be noted that *Twitch* has not led to the demise of the traditional games reviewer – both print game journalists and video game journalists continue to thrive. Although research in this area is light, given its contemporary nature, there seem to be several reasons for this. First, as noted above, watching a *Twitch* streamer playing a game one is considering purchasing yields only a snippet of that game; one would have to watch for a long time to get anything close to the broad, overall, sweeping summary that a pre-*Twitch* review will provide. Traditional reviewers are therefore still able to offer 'big-picture' observations that reflect the time they have spent with the game – and the time committed to thinking about, and then describing, their experiences – that are a sharp contrast to the stream-of-consciousness reviewing experience offered by *Twitch*. Second, related to this first point, it is clear that consumers remain interested in the *expertise* deployed by game reviewers (cf. Casaló et al., 2015; Liu et al., 2008) These are individuals who have done this for a long time, have proven credentials in the area and present a sustained analysis instead of a gradual running commentary. A streamer explicitly asked about a game by a viewer will give their reflections, but traditional reviewers take far longer to get their thoughts in order and produce a comprehensive, cohesive perspective on the game in question. Third, in turn, consumers continue to read and watch the reviews of their favourite game journalists, interested both in critique and in reading content from a writer whose personality, or perspective, is specifically valued; many traditional game reviewers maintain loyal fan bases (Peterson, 2013) relatively unmoved by the growth of streaming. Fourth, many video game consumers are very particular about avoiding 'spoilers', which is to say, revealing plot details. Whereas traditional game journalists have become assiduous about dodging such pitfalls, preferring to show 'generic' moments of gameplay rather than potentially crucial elements of plot or narrative, live streaming – being the *live* play of a game likely unknown to the streamer as much as to the viewer – cannot guarantee a spoiler-free experience. For the player who wants to learn as much about a game as possible without learning anything they *don't* want to know (naturally a difficult balancing-act), the traditional game reviewer's skill at writing and presenting, combined with their deliberate lack of spoilers, offers a service that live streaming cannot. When it comes to reviewing and its place and entanglements within the games industry, some things stay the same, while others are being deeply changed by live streaming.

To summarise this section, the rise and rapid expansion of live streaming on *Twitch* has led to a new form of game reviewing, which has challenged existing norms of written and recorded-video reviews. It offers a range of positives that previous review forms cannot match, such as the ability to speak directly to the reviewer, and the ability to see far more of the game before making a choice than would otherwise be the case. The role of the 'reviewer' as a critical voice with unique access to a game who can inform consumers about potential purchases is shrinking, and much of this role is now taken by live streaming. However, this development has not been universally accepted by game developers, publishers, nor indeed consumers. Some game companies have pushed back against the live streaming of their content, fearing a loss of sales, while many players continue to use traditional game reviewers for their information about new games, preferring to focus on expertise and the skilled curation of important game moments and elements rather than a longer, but inevitably less

focused, look at a wider portion of the game by a game player just like them. Such playbor (Kücklich, 2005) in live streaming 'reviewing' does not explicitly frame itself as labour, as a review, or as work, but the act of broadcasting a new game in the detail and with the commitment of most streamers cannot help but serve such a role. This, we propose, will become an increasingly important site of contestation between the impacts of live streaming and the preferences of the longer established games industry in the coming years; *Twitch* and live streaming widen the scope of who can review, increase the content of games consumers can experience without buying the game itself and in doing so disrupt many of the existing norms of the games sector.

Streaming as game visibility and lifespan

We now turn to considering shifts in the visibility and lifespan of games through streaming. This has three components. In the first instance, live streaming has been essential to the wide success of a number of 'independent' or 'indie' games, which have reached a far greater market than would previously have been the case through their broadcast by high-profile live streamers. While the 'visibility of video games pervades all aspects of popular culture', the question of the visibility of individual games remains very important (Zackariasson and Wilson, 2013: 56). Independent games are games produced by small teams, generally of fewer than 10 people and potentially only a single creator, and are known for being more original, daring or unusual (Martin and Deuze, 2009; White, 2009; etc.) than the triple-A titles whose publishers dominate the reviewing space discussed in the previous section. Without the financial and political backing of such publishers, and in a deeply saturated indie game marketplace, such games can struggle to achieve visibility – *Twitch*, however, has become a major player in the indie game ecosystem which supports the success of such games. In the second case, live streaming has also served to extend the life spans of many older games which had few if any players remaining before the emergence of live streaming as a leading gaming practice. A number of games that are years and even decades old have returned to visibility through a number of means, although primarily through the growth of the 'speedrunning' (Scully-Blaker, 2016) community. In the third case, *Twitch* is also replete with broadcasts of non-digital games and non-digital game-related activities, such as playing analogue games (board games, card games, tabletop roleplaying games), or creating artwork, costumes, music, recording podcasts and so forth. We will also tackle these and begin to explore some of the ways these are affecting the games industry, game communities and fandom. In all three of these cases, therefore, we show that *Twitch* and live streaming are transforming the standard distribution of visibility across competing games within the sector, the lifecycles of games and the communities that surround games – as well as the purchasing and leisure-time preferences of those communities.

Independent video games have been one of the most important developments in the games industry of the last decade, exhibiting rapid growth (Crogan, 2018). Beginning with highly visible and highly successful titles such as *Braid* (2008) and *World of Goo* (2008), independent games have become noted for their creativity. However, it was soon observed that independent games were primarily spreading through word of mouth (Lipkin, 2012) and indeed positive reviews from interested journalists. For example, the success of *Steamworld Dig* (2013) was 'almost entirely thanks to the unpaid evangelism of its earliest adopters' (McElroy, 2013). Without the advertising budget of major game publishers (Swain, 2009), independent games could struggle to get heard. This was exacerbated by a subsequent expansion in the volume of professional independent games produced in the mid-2010s, alongside a rapid growth of extremely low-quality 'beginner' titles flooding online platforms such as *Steam Greenlight* (Fearon, 2017; Grayson, 2015). Into this situation came *Twitch*, which has come to serve as something of a quality-control mechanism for independent games – noteworthy independent games have found significant communities of players, and streamers dedicated to their play, on the platform. Indie titles that have been particularly successful on *Twitch* in recent years include *The Binding of Isaac* (2011), *Minecraft* (2011), *FTL* (2012), *Don't*

Starve (2013), *Kerbal Space Program* (2015), *Prison Architect* (2015), *Darkest Dungeon* (2016), *Stardew Valley* (2016) and *Cuphead* (2017). Many of these have acquired dedicated viewing communities on *Twitch* (and also on *YouTube*), with these games gaining significant visibility through their presence on the streaming platform. As a result, *Twitch* has become an important site for boosting the visibility of independent games, whereby streamers serve in lieu of a larger formal advertising budget and labour is performed by streamers who benefit both themselves and the games' developers through their actions; equally, for the reasons discussed in the previous section, the platform has served to offer informal 'reviews' for less visible games that might not ordinarily be covered by the mainstream gaming press. Being a form of advertising for game companies, this is again a kind of playbor (Kücklich), but one where some of the reward for that effort is gathered by actors likely entirely unrelated to the streamers: which is to say, game companies. The play of these games also performs work to market the game in question, by showing viewers information from which they can make consumer judgements. There are, however, complications to this, such as narrative-driven games whose sales might be adversely affected by broadcasting (Parker, 2018), and the broader complexity of the indie games ecosystem beyond marketing paradigms.

Twitch has been instrumental to the scale of the success of numerous independent games which have found visibility on the platform and consequently purchases from a wider demographic. However, *Twitch* and live streaming have not just affected the success of independent games; they have also led to 'second lives' for much older games, expanding the viable lifespan of video games beyond traditional expectations and thereby adjusting how developers think about games, but also how games culture and history are curated. Most prominently, the community around 'speedrunning' – completing a game, or a fixed portion of a game, as quickly as possible (Scully-Blaker, 2016) – has brought a wide range of old games back into vogue years, or even decades, after their initial release (and the expected decline, with age, in their popularity). Perhaps most visible are the communities around *Super Mario 64* (1996) and *Ocarina of Time* (1998), with broadcasts of these games regularly bringing in tens of thousands of concurrent viewers, and many more than that number of unique viewers over longer periods. These games are both considered to be especially good for speedrunning due to the complexity and challenge of their rapid completion while also drawing on the nostalgia viewers feel for much-loved older games, now transformed and played in an entirely new manner. Some speedrunners have actively purchased outdated consoles and older games in order to be a part of this community and these practices, so significant has this trend become.

Ordinarily, the lifecycle of games are understood as progressing along a downward curve of value; the longer the game has been out, the more flooded the market is, and the less the demand for the game, and thus prices drop. There are of course exceptions – extremely rare older games can sell for significant amounts of money – but this decline in price is consistent. However, older games are still being played, finding new life, even new purchases and interest through community engagement on *Twitch*. Bogost (2015:163–170) has previously discussed the concept of a game which is good enough that it can be played indefinitely, a status that many consider Chess or Go to possess; in video games, however, this is extremely rare. Through *Twitch*, however, we perhaps see the initial stages of games being understood in this way – games which can be played once in one form and then adapted and altered to maintain continued playability. Whereas many games rely on 'mods' to keep a community alive and coming back to the game, older games broadcasted on *Twitch* rely on speedrunning and comparable challenges, and the appeal of spectatorship, instead, allowing a game to evolve to create and exploit a new niche for entertainment. This can affect how those in the video game industry think about the long-term viability and potential audiences for games, as well as players.

We must also note that alongside independent games gaining publicity, and older games gaining newfound attention years or even decades after release, *Twitch* has also been instrumental in enhancing the visibility and appeal of a number of analogue, non-digital games. Collectible card games such as *Magic: The Gathering* and many others are routinely streamed, primarily in their analogue version but also sometimes in digital equivalents of the physical originals; tabletop roleplaying games with miniatures or pen-and-paper, such as *Dungeons and Dragons* or *Warhammer 40,000*, are also regularly broadcast; classical board games like Chess and Go are also streamed, although primarily in the context of major formal tournaments, and these games are stretching traditional understandings of the video games industry, taking in non-digital games as they are broadcast online. Nevertheless, all of these demonstrate that with *Twitch*, many of these games have been viewed by the largest simultaneous crowds of individuals in recent history, and perhaps, ever. For example, *Counter-Strike: Global Offensive* (2012) had a peak concurrent viewership of 1,130,000 (Patterson, 2018), while 'Dr. Disrespect' had a peak of 388,000 as an individual streamer (Alexander, 2018). Now non-digital games of all kinds are finding a home in the streaming service. In all of these cases, games that have been either entirely devoid of broadcast spectatorship, or which have only rarely enjoyed its benefits, have found significant impact and visibility on the platform. For the analogue games industry, therefore, *Twitch* has had a comparable effect to what it has for independent video games, bring together online communities to reshape interactions of play with audiences.

To summarise this second section, we can therefore see that as well as streaming transforming game reviewing, it is also transforming game *visibility* and *lifespan*. Independent games produced by small teams, potentially as little as one individual, can now rapidly rise to visibility if they are fortunate enough to find a successful streamer who finds their game compelling. Older games, whose lifecycles as media products seemed to have come to an end, have discovered new lives on the streaming service, both being played as originally intended and being played in new, unusual and potentially even subversive ways. Non-digital games, ranging from traditional to modern board games and from card games to tabletop games, have all found dedicated audiences, in some cases likely larger audiences than those games have ever had. Fan communities united by games, meanwhile, have found a new method to share discussion, creative pursuits and enthusiasm for their chosen media. In all of these ways, live streaming is significantly affecting the scope, ebb-and-flow and overall dynamics of game visibility and publicity, taking previous expectations rooted in time and genre and replacing them with new assumptions and structures we are only now beginning to study and understand.

Streaming as education in game development

We have now considered how live streaming and *Twitch* are reshaping the act of games reviewing (a central site of political-economic contestation within an increasingly industrialised, competitive, over-extended industry) and the visibility and lifespan of both new and old games of multiple genres and materialities. In both of these cases, live streaming is having a significant effect on the games industry, both reshaping power relations and purchasing dynamics when it comes to the reviewing of contemporary games, and altering the anticipated visibility and timescales of a wide range of different games. We now come to consider how streaming is transforming the *production* of games, and the access that aspirant game designers have to game development as a practice and an industry. Game production is highly time-intensive and effort-intensive activity (Arakji and Lang, 2007) and now a major globally distributed element of the contemporary capitalist economy (Dyer-Witheford and de Peuter, 2009). In recent years, crowdfunding has also played a role in the funding of games and the particular modalities of their production (Smith, 2015), but this has done little to reduce the required *labour* of game construction. However, many *Twitch* channels are focused on the live streaming of game development, allowing viewers to observe the game development

process, actively responding to viewer questions and teaching viewers game development, and everything in-between. As we explore in this section, these broadcasts are beginning to transform the demographics who have access to the kind of expertise needed to begin a career in game development, having both current and potential future, impacts on the games industry through this wide dissemination of game development expertise. Considering who makes games, and in what contexts, is of the utmost importance in the games industry – in a sector that struggles (Ramanan, 2017) to include ethnic minorities, sexual minorities and women, the broadening of expertise into new communities will likely serve to enhance the diversity of the sector, and thus both the employment opportunities it offers, and variation and originality in the creative products it yields. Compared to the elements of *Twitch* previously explored in this article, game development broadcasts are a nascent phenomenon which have yet to achieve the scope or popularity of independent games, older games, creative game-related pursuits and streaming-oriented game reviewing. Nevertheless, we believe they herald potentially important shifts in the games industry and therefore merit consideration here.

Learning games programming is ordinarily done through a range of means: the aspirant game developer might take a University course, sign up to night classes, utilise online tutorials, purchase programming books or (as in the case of the first author) simply experiment with a programming language until one figures out what works and what does not. This means that acquiring game programming knowledge is primarily contingent on financial investment, and when not, it is unusual to have direct contact with a more experienced programmer who can support the learning process. *Twitch*, however, has become a new site for the transfer of game design and game development knowledge, through the rise of 'coding streams'. On such channels, the streamer broadcasts a live feed of the programs and desktop on their computer while they program or otherwise design a game (or, more rarely, a non-game piece of software). This will often mean broadcasting live video of the streamer developing the program's code, testing new versions of the software being developed and thereby showing viewers the process of developing, refining, testing and iterating on the code of a game or other piece of software. There are relatively few coding streamers who are exclusively coding streamers; many stream a range of other content as well, with many only choosing to broadcast their coding during a special event, such as a 'game jam'. A game jam is a period in which game-makers from all around the world come together to generally collaboratively, although sometimes competitively, produces games within a constrained period of time (Preston et al., 2012). For example, the 'Global Game Jam' entails 'thousands of computer game enthusiasts participat[ing] in [a] forty-eight hour challenge to make games' (Fowler et al., 2013: 1). Game jams have already become an important element of game design and game development learning for aspiring game-makers, bringing together multiple interested parties for a tightly focused project that then elicits feedback from their colleagues and fellow game-makers. Through *Twitch*, however, the community aspect of game jams has become increasingly central.

As such, we propose that *Twitch* is beginning a process of democratising access to the games industry. The videogames industry has always drawn on different 'creative collaborative process[es]' (O'Donnell, 2012), and even the 'co-creation' of players and developers (Banks, 2013), but this is now going further. For example, coding broadcasts are spreading game development knowledge to an increasingly wide community, and allowing that community to learn by watching, and through direct conversation with those more skilled. In a sense, we might suggest that game programming knowledge has traditionally existed in two forms – as that behind 'paywalls' implemented by the requirements of higher education, the independent purchasing of training courses or information stored in books and other physical resources, or that which is freely available online, but without any direct engagement between the learner and provider (and often without the kind of step-by-step detail that *Twitch* provides).

By contrast, *Twitch* offers a new source of free programming knowledge, and one which is distinguished by its lack of cost, its detail (for one sees everything the programmer is doing) and the ability to speak directly to the programmer during the process in order to understand what they are doing, how to fix any issues in the viewer's own programming and so forth. One respondent, R5, was the community manager at a major game development company, who streamed 'our games' on *Twitch*. This did not only mean finished games but also games in the process of development, through which this process of broadcasting served both as advertising and as shedding a light on some – public-facing – aspects of the game design process. Similarly, R6 told us that as *Twitch* expands they hope to see them 'partnering up with major developers' to broadcast the process of game development, because 'everyone's yearning to learn on *Twitch*' and there is thus a significant untapped market. Developers such as the company of R5 are very much in the minority, with most game development broadcasts being amateur or 'independent' (a small games company) in nature; respondents therefore responded positively to this element of the *Twitch* ecosystem, having both found ways to take advantage of its opportunities and encouraging the company to do more in this direction. In essence, this is free labour (Terranova, 2004): unlike a university running a game development course, the streamer is either not remunerated or remunerated to only a small degree, and the labour that goes into these streams is being provided voluntarily. Although a smaller phenomenon than the others explored in this article, we believe that this new spreading of game design and game development knowledge might well, in the medium-to-long term, have a significant impact on how people learn to design and develop games, spreading knowledge of game making into new communities and potentially bringing new individuals into the games industry. 'Fans and hobbyist groups' (Aoyama and Izushi, 2008) have always been important to the spreading of knowledge and expertise in game development, and the advent of live-streamed game development appears to have accelerated these processes of skill diffusion even more.

Conclusion

In this article, we have reflected on some of the initial effects that the striking expansion and newfound ubiquity of live streaming, embodied primarily in most countries by platform *Twitch.tv*, has had on the games industry. We have focused here on three aspects: first, streaming as a form of games reviewing; second, streaming as a boost to game visibility and lifespan; and third, streaming as a method for expanding the reach of game programming knowledge and expertise. In the first case, we showed that *Twitch* is reshaping games reviewing, offering a viable alternative with significant advantages (although also disadvantages) over the existing paradigms. In the second case, we showed that independent games have found unusual success through live streaming, with older and even analogue games being broadcast in new ways to new audiences, reshaping notions of game lifespan and continued viability. In the third case, we proposed that the ability to broadcast game design and game development on *Twitch* has the potential to be an important new development for the games industry and an important one to continue to track over the coming years.

The emergence of content creation platforms, of which *Twitch* is the preeminent example, has significantly reshaped how digital content is created, distributed, accessed and integrated with other industries. No longer are major corporations tightly controlling the entire value chain of media production and consumption, a contrast particularly apparent when we compare *Twitch* to linear television or more traditional print media. Although the term 'disruptive' has a tendency to be overused in a digital context, its application is clearly suitable with *Twitch*. The growth of *Twitch* as a platform has had an empowering effect on individuals and their relationships with corporations or other powerful actors within the games ecosystem. The result is a relative democratisation of content creation and consumption, seen particularly with the emergence of gaming communities around new celebrities. The rapid growth of platforms across the economy and forms of social

interaction means that developing an understanding of how *Twitch* (both by itself, and through its ownership by *Amazon*) will impact the video games industry is particularly important. While many platforms tend towards exhibiting monopolising tendencies (Srnicek, 2017), this article highlights how *Twitch* is reshaping the video games industry in interesting and sometimes unexpected ways outside of the platform itself. Many actors in the games industry are either embracing this or being forced to respond to this, resulting in new connections emerging between players, workers, production, consumption and our understandings of individual games as media items. We therefore believe that further exploration of live streaming is crucial not just for understanding where the games industry is now, but also where it is going in the future, a future which appears increasingly democratised and increasingly open to new actors.

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