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The work of play: Marx and the video games industry in the United Kingdom

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Abstract

The video games industry in the United Kingdom is profitable and growing at a time when the broader economy is still failing to recover. This has attracted the interests of politicians, committing large investments and tax breaks. Although the headline figures are impressive, the overall structure of the industry is less clear. Within this there are many new organizations, often shaped by start-up culture. Less is known about how work is being organized or the experiences of workers. The approach taken here draws on Marxist theory and an examination of the labour process. It focuses on how capitalism effects the production of video games, including the use of crunch time, the prevalence of sexism, and the widespread use of non-disclosure agreements. The conclusion suggests further inquiries are needed to understand how the struggle between labour and capital is shaping this industry.

Keywords

video games, Marx, Marxism, labour process, digital labour, United Kingdom

Introduction

They become like blinking lizards, motionless, absorbed, only the twitching of their hands showing they are still conscious. These machines teach them nothing. They stimulate no ratiocination, discovery or feat of memory – though some of them may cunningly pretend to be educational...

So I say now: stop just lying there in your post-Christmas state of crapulous indifference. Get up off the sofa. Can the DVD of *Desperate Housewives*, and go to where your children are sitting in auto-lobotomy in front of the console.

Summon up all your strength, all your courage. Steel yourself for the screams and yank out that plug. And if they still kick up a fuss, then get out the sledgehammer and strike a blow for literacy. (Johnson 2006)

My research takes this unusual quotation as a starting point to reinforce the need to critically analyse the games industry. Ten years ago Boris Johnson (2006) wrote this scathing attack on games, focusing particularly on the claim that they were linked to low literacy rates. His solution was to call for a violent

response. Fast forward a decade and Boris Johnson, now the Mayor of London, has noticeably changed his opinion on the topic, as Benson (2016) points out. During the announcement for a new round of funding for the games industry in London – this time for £1.2m – Johnson's tone had drastically shifted:

We're home to fantastic software studios, like State of Play and Sports Interactive, who make world-leading games, like Lumino City and Football Manager. From NASA to the NHS, games software now influences the way we manage our health, educate our children, and even how we explore space but international competition remains fierce and we need to ensure our city can compete with our global gaming rivals. Games London will be a three year program that will help the game sector shout louder and attract more investment. (quoted in Benson 2016)

This newfound passion for the games industry is not limited to one member of the ruling Conservative party. In the introduction to the Olsberg-SPI and Nordicity (2015: v) report on the economic contribution of the creative industries, a foreword is included by the chancellor George Osborne. He cites the game industry as 'one of the UK's great strengths' and remarks that now is a 'golden age' for the creative sector, also including films, high-end TV, and animation programming.

These comments, and indeed investments, from the political representatives of the ruling class in the United Kingdom signal the important role that the games industry now plays in contemporary capitalism. My research intends to provide a topography of the industry in the United Kingdom, defining some of the key features and dynamics, and exploring what is behind these kind of statements. In particular, this requires a focus on the labour process – the work that actually goes into making video games. Dyer-Witheford (2015: 42) has captured the broader changes in work with the concept of the 'cyber-proletariat' and 'taking the ideas of cybernetic thinkers as a guide to how computers in general have altered the technological processes of capital'. This global scope of the transformation of work includes call centre operators, miners in the global south, and the dagongmei in the high-tech factories of China, for example. The argument here focuses that framing analysis onto one part of this new composition of labour – video game developers – while keeping in mind how their labour processes relate to and rely upon the 'cyber-proletariat' in various ways. The focus is therefore shifted away from the headline figures and announcements onto the labour process to develop an understanding of how games are produced, why they are made in this way, who does the work, and under what conditions.

A Marxist approach can further this inquiry into video games, despite the changes that have taken place since Marx was writing. The relevance of Marx for video game may not at first seem apparent, but it can be illustrated in the following example. Marx had a surprising cameo role in last year's *Assassin's Creed* sequel *Syndicate*. He features in a set of side-missions for the action-adventure game set in Victorian London against the backdrop of the industrial revolution. On meeting the protagonists of the game the Frye twins, Marx says: 'I challenge you both to help those who REALLY need your assistance. The working people' [emphasis in the original]. One of the twins, Evie, replies: 'an interesting challenge. We accept'. After completing the first task, Marx then requests help finding proof of the conditions in a nearby factory. He suggests that the twins set fire to bales of cotton and in the ensuing chaos leave with the factory's reports (Assassinscreed.wikia 2015).

Games often take artistic licence with historical details, but there is an important point buried within this example. Although the thought of Marx employing twin assassins equipped with rope launchers and hidden blade gauntlets is certainly entertaining, in reality the sources for his research on factories were much less exciting. In *Capital*, and in particular chapter ten on the Working Day, Marx (1976) draws heavily on evidence from the bourgeois factory inspectors. There was no need for subterfuge to find out this information, but there does need to be an awareness that these inspectors began their research from a very different starting point. They were not interested in understanding the dynamics of workers' struggles, nor how they could develop and succeed. The reports were crucial for Marx to develop an understanding of the dynamics of capital, but later he proposed a workers' inquiry to try and draw workers themselves into the process of knowledge production – or even co-production – in an attempt tied to an organizational project (Marx 1938). The results of the inquiry were never published, but it sparked a diverse tradition of attempts to use the method, including the Johnson-Forest Tendency, *Socialisme ou Barbarie*, Italian Workerism, and the theoretical descendants of Autonomist Marxism (Woodcock 2014).

The sections that follow are intended as kind of pre-inquiry of the video games industry, taking as a starting point the 'new' inspectors of industry: independent research institutes and consultants. For example, the recent reports by Mateos-Garcia et al. (2014) and Olsberg-SPI and Nordicity (2015) provide statistical overviews of the games industry in the United Kingdom, but like the factory inspectors they do not take a Marxist approach.

The topography of the games industry in the United Kingdom

The games industry has undergone significant growth in recent years and this trend is set to continue. It is therefore unsurprising that the Conservatives quoted above are drawn to praising and investing in the industry, particularly as the 'green shoots' of economic recovery remain hard to spot further afield. The size of the global games market was \$83.6bn in 2014 and this is estimated to increase to \$113bn by 2018 (Newzoo 2015). Not only are vast sums of money involved, but games have an increasingly global reach, with an estimated 1.6bn players worldwide in 2013 (Newzoo 2014). This comes at a time when growth rates in the global north have been sluggish at best in the wake of the 2008 financial crisis. In comparison with other productive sectors it is no wonder the video games industry is becoming heralded as a key sector in the economy. While the industry has existed in the United Kingdom since the 1980s with its roots in 'bedroom coding', it is now in a position of 'global leadership, combining arts and technology to deliver some of the most successful games in the history of the medium' (Mateos-Garcia et al. 2014: 6). For example, *Grand Theft Auto V* was developed in the United Kingdom and has so far sold more than 54m copies, generating \$2.3bn in sales. For comparison, this is approximately the same amount that *Star Wars: Episode VII - The Force Awakens* (Abrams 2015) is expected to take at the global box office (Groux 2016). However, despite the recognition of the industry as a 'highly innovative part of the UK's creative economy', Mateos-Garcia et al. (2014: 4) explain that 'hard data about its economic performance and geography are difficult to come by'.

In order to develop an overall picture of the games industry in the United Kingdom it is therefore necessary to cut through the marketing bluster and posturing of government officials. As mentioned before, there is likely to be some element of projecting desperate hopes for an economic recovery

onto it, not necessarily underpinned with economic analysis, nor with an understanding of games or the industry.

Mateos-Garcia et al. (2014) do provide an overall analysis of the games industry in the United Kingdom with some interesting statistics. Through a process of data scraping they discovered a total of 226,302 unique game titles with developers and publishers. Narrowing this down to the United Kingdom they found 1902 active companies (Mateos-Garcia et al. 2014: 14–15). Within this group of companies, almost 90% were formed after 2000. The number of new companies grew annually by 22% between 2011 and 2013, which is almost fifteen times as fast as the overall UK economy (Mateos-Garcia et al. 2014: 20). A total of 75% of the new companies since 2010 only develop for iOS and the sector overall is dividing into mobile or traditional platform companies. Half of the companies are based in London or the South of England, with emerging clusters in a number of cities across the United Kingdom (Mateos-Garcia et al. 2014: 4). From these local clusters it is comparatively easy to reach global markets with huge potential audiences. In terms of the current dynamics of the industry, Olsberg-SPI and Nordicity (2015: 59) calculate that the core UK video games sector generated £755.4m directly in GVA and 12,100 FTE (full time equivalent) jobs in 2013. Moreover, taking into account the overall economic contribution of the industry, this rises to £1.4bn GVA, £429m in tax revenue, and 23,900 FTE roles. Similarly, Mateos-Garcia et al. (2014: 5) estimate the Gross Value Added (GVA) is as high as £1.72bn. In comparison with the creative sector in the United Kingdom more generally this is significant, making up over a third of the total FTE jobs (Olsberg-SPI and Nordicity 2015: 73).

The vast amounts of money involved in the production, development, and sales of games is one reason why it has become the focus of attention. For example, the Conservative party has made the growth of the industry a new priority, introducing the Video Games Tax Relief (VGTR) policy in April 2014 (Olsberg-SPI and Nordicity 2015: 7). The impact of this only now starting to become clear, and it is likely that growth and profits have accelerated significantly since then. However, the UK government is not alone, as there has 'been increasing competition by governments seeking to attract video game development studios to their jurisdictions' (Olsberg-SPI and Nordicity 2015: 52). There have been a number of other attempts to facilitate growth in the United Kingdom, including teaching computing and coding in schools and the introduction of funding bodies, organizations like Tech City UK, accelerators, incubators and digital catapults. However, as Mateos-Garcia et al. (2014: 6) point out, it is 'nigh on impossible to predict today what new technologies, business models and competitors will emerge next to disrupt the sector – though it is certain that this will happen'.

Video game production under capitalism

It is difficult to get a clear picture of the companies involved in the games industry. In part this is due to its 'protean nature', but also because many of the companies are small in size due to the 'pervasive start-up culture' (Olsberg-SPI and Nordicity 2015: 52). In the sample used by Mateos-Garcia et al. (2014: 16), 95% of the companies were micro or small businesses. Due to regulations in the United Kingdom, only companies with more than 50 employees, over £6.5m in net turnover, or balance sheets of more than £3.26m have to report business data, resulting in only 6% of businesses having information available. However, rather than trying to build a static picture of the industry – indeed one likely to be out of date in a matter of months – is more useful to try and understand the emerging dynamics. For example, as Dyer-Witheford and de Peuter (2009: xix) argued, by situating 'virtual

games within a system of global ownership, privatized property, coercive class relations, military operations and radical struggle’.

The growth of the games industry has to be situated within the ongoing contemporary transformations of capitalism. The disintegration of manufacturing and the rise of service work associated with the rise of post-Fordism are now regularly compounded with threat of automation. Not only is there said to be a risk for low-skilled work, but also the possibilities that automation could reach into white-collar work too. The convergence of two events in 2008 – the launch of the Apple Store and the start of the global financial crisis – therefore did wonders for this narrative of the new economy, which Dyer-Witthford (2015: 173) captures as ‘the idea that micro-programs for mobiles were the panacea for the recession’. Apps, like games, are not produced, distributed or consumed at the national level. In fact, as Kirkpatrick (2013: 109) argues, the ‘computer game industry is an exemplary global business in that its dominant organizations share a strategic orientation which exceeds any particular territorial affiliation’. This orientation includes outsourcing relationships from the global north to the south, including the subcontracting of activities like “porting” existing games to additional platforms, rote programming, and made-to-order artwork’ (Dyer-Witthford and de Peuter 2009: 50). This trend, as Vercellone (2007 quoted in Dyer-Witthford and de Peuter 2009: 50) argues, involves the rise of ‘neo-Taylorist functions’ and the growth of ‘precarious jobs in the new cognitive division of labour’. To illustrate the scale of these exploitative relationships, a software developer at Verizon was recently caught outsourcing his own job to a Chinese consulting firm, paying them just one-fifth of his six-figure salary, leaving him to watch cat videos and browse social media at work (Davies 2013).

While there are differences in the kinds of software development jobs – whether in the type of work or the wages received for completing it – the distinctions across the world are much clearer when it comes to the global labour arbitrage that takes place across supply chains. Software – regardless of how, where, why, or by whom it is produced – needs hardware of some sort in order to run. This requires the physical production of smartphones, tablets, computers, laptops, and game consoles. The production of this physical hardware does not involve immaterial labour. Rather, ‘it is industrial and bluntly material: extruding plastics and sheet metal for box enclosure, connecting cables, installing circuit boards, attaching shells, and checking production flow’ (Dyer-Witthford and de Peuter 2009: 77). The condition under which this production is organized, particularly with the dagongmei – female migrant workers in China – as detailed by Ngai (2005; 2016), are much closer to that found in Marx’s chapter on the Working Day than the new campus-style workplaces of companies like Google (Girard 2009).

Despite this global reach, both in terms of production and consumption, there remain important national features in the United Kingdom. While focusing on these it is important to keep in mind how they are integrated onto the global level. As Kirkpatrick (2013: 117) argues, ‘national industries where aspects of a craft ethos persist [...] make for a superior final product’, which ‘points to the enduring importance of local variations in employment and working practices’. Therefore, the games industry in the United Kingdom can be divided into three different segments: development, publishing, and consumption. The first part of this value chain is the development, which involves the studios (whether independent or affiliated to a particular publisher) that create new games. One of the notable trends is that while studios used to do this while under a publishing contract, increasing numbers are doing so independently. In some cases this has also involved seeking alternative financing from crowdfunding websites like Kickstarter, altering the traditional relationships in the industry. Games Investor

Consulting (quoted in Olsberg-SPI and Nordicity 2015: 54) reports that 9900 workers were employed in 'creative roles'. As there are an estimated 10 per cent of workers on part time contracts, the approximate figure of 9400 FTE 'indicates that the GVA per FTE in the video games sector in 2013 was £67,992' or £639.1m in direct GVA in 2013 (Olsberg-SPI and Nordicity 2015: 54). While this is a schematic calculation, it does give a very rough indication of the scope for extracting surplus value from these creative workers.

The second segment is publishing, which could be compared to distribution in film and television. Historically – and the changes mentioned above about increasing numbers of independent studio should be kept in mind – publishers funded developers and then marketed and distributed the finished games. This involves varying levels of control, creative and otherwise, between publishers and developers. There were estimated to be 3100 people working in game publishing in the United Kingdom in 2013, although when taking into account the proportion of the games that were developed in the United Kingdom, this falls to around 900 (Olsberg-SPI and Nordicity 2015: 56). The third segment is consumption, covering the ways in which customers are connected to games. This traditionally involved the sale of boxed games in retail space, but the growth of digital platforms like Steam, iOS, Android, or console online stores has changed this drastically. In 2013 in the United Kingdom alone, consumers spent £2.5bn on games, including boxed software, online downloads, mobile, points cards and second-hand software (Olsberg-SPI and Nordicity 2015: 58).

The first section of the industry, development, is clearly the central component. The remaining two parts are dependent on the development of games and themselves are subject to disruptive changes. While high-street stores for video games used to be a fairly common sight, increasingly consumption is fulfilled online through platforms like Steam and gog.com or the stores accessed through the PlayStation or Xbox consoles. However, these still require complex supply chains for hardware, logistical networks, and the availability of high-speed internet connections. The emergence of increasing numbers of independent – or indie – developers has complicated the overall structure of the industry. Yet there are still very large companies like Microsoft, Sony, Activision, Ubisoft, and Electronic Arts (EA) that dominate across the industry. Dyer-Witheford and de Peuter (2009: 66) focus on EA, explaining how their 'licensed-property game factories are a massive presence in the game business'. When compared to a small development studio with a handful of employees, 'the corporation's vertical control of production, publishing, licensing, and distribution gives it a pervasive presence'. This has a comparable effect to that of multinational companies, as EA for example, 'exemplifies tendencies – toward concentration of ownership, repetitious licensed franchises, world-market business strategies, maximizing the advantages of "glocalization"'. Seen, for example, in the yearly releases of online-FPS games, sports franchises, and long running series like *Assassin's Creed* mentioned at the start. The production involves 'the highly disciplined and exploitative control of its cognitariat workforce – increasingly prominent in cognitive capitalism generally'.

This kind of video game production involves the large scale investment of capital and intensive division of labour. This tendency is not only due to the relationships between publishers and game studios, but also the introduction and development of technology in the industry. Most games are not written from new, instead they utilize game engines and various kinds of middleware. As Kirkpatrick (2013: 100) points out, in this process, 'the creative role of designers and developers faces off against the economic imperatives of efficient production for a competitive market, reflected in the demands of publishers and console manufacturers and embodied in technology'. An important instance of this is

software development kits (SDKs), which have a twofold effect on production. The first is that it narrows the range of options available to developers, homogenizing the kinds of games that are produced. This does not happen in an explicit way, rather the obligation to use the SDK 'has a perhaps imperceptible, effect of inhibiting their own ideas about the direction a game might go in, the kinds of event it might include, even its central concept'. The second is that 'SDKs rationalize the labour process itself', breaking up the overall processes of production into smaller separate parts (Kirkpatrick 2013: 106).

The introduction of capital intensive methods to video game production has resulted in a number of changes. The most important of these is a concerted attempt at managerial control. At the start of a development cycle, management asserts the 'determination to control, in a highly predictable manner, the outcome of a complex, potentially chaotic production process'. This means that innovation, something that always entails some level of risk, is removed 'so that later stages proceed in a highly productive, parallelized fashion'. This is necessary because the 'video game business is extremely time sensitive' (Dyer-Witheford and de Peuter 2009: 59). Games with huge budgets need to be launched at specific times: whether in relation to other games, before the holidays, to tie-in with films, or simply to synchronize with expensive and extensive marketing campaigns. The final stage of the development cycle before launch has therefore become synonymous with 'crunch time' – the 'industry term for an ostensibly unusual period of crisis in the production schedule' when working time can increase to as high as 100-hours per week. While this is supposed to be an abnormal moment, the 'routinization of unpaid hours' has become 'an expected part of work – fulfilling, in other words, the classic definition of exploitation' (Dyer-Witheford and de Peuter 2009: 59).

The workplace

There are some broad statistics than can be gleaned from surveys of the games industry to explore what games studios are like in the United Kingdom. For example, one recent survey found that 86% of staff were permanent, with the remaining 14% working freelance. This is the lowest rate across the creative media sector, which averages 30% (Renevey 2015). The average annual income is £34,200 – which is 10% higher than other creative media jobs and 25% more than the UK mean average. Despite the same caveats as before, this figure is around half the GVA per FTE, signalling the potential value of each worker to employers. The average age of the workforce is low, with 68% of workers under the age of 35, comparing to 48% in creative media and 35% across the United Kingdom more generally. The demographic that works in these studios is similar to what Dyer-Witheford (2015: 173) describes in app crowdsourcing, depending on 'a certain subjectivity, a special stratum of labour power always integral to the computer software industry: youthful, predominantly male, technically wizard, sceptical towards suits, outside the union traditions, and ideologically in varying proportions, libertarian, entrepreneurial and idealist' (Dyer-Witheford and de Peuter 2009: 27).

The subjectivity of this group of workers 'continues the tradition of hacker culture from which games sprang', but while this was 'initially a subversive threat [...] the game industry has increasingly learned to suck up volunteer production as a source of innovation and profit'. However, much like the challenges of management across different kinds of workplaces, the indeterminacy of labour power makes this far from straightforward. Therefore the 'capture is not seamless; the capacities that make playbor so productive also make it troublesome' (Dyer-Witheford and de Peuter 2009: 27). The

complication is that 'playbour' – a hybridized form of work and play (Kücklich 2005) – stems from the traditions of hacker culture and the ethos of open source software. It originates as a response to the Fordist, Taylorized workplaces of the past (or, more accurately, shifted away from the global north). As both Dyer-Witheford and de Peuter (2009) and Kirkpatrick (2013) argue, the post-1968 refusal of work has done much to shape video games. Atari even made 'this "refusal of work" its key to commercial success' (Dyer-Witheford and de Peuter 2009: 12).

These elements of counterculture combine with corporate capitalism in various ways to gloss over some of the contradictions of the workplace. For example, the workforce in the United Kingdom is overwhelmingly white, with only 4.7% representation for Black and Minority Ethnic (BAME). 14% of the workforce are women, with 79% under the age of 35 and earning 15% on average less than men (Renevey 2015). Behind these headline figures, a different survey found that a 45% 'felt that their gender had been a limiting factor in their career progression, offering a significant barrier to their progress. A further 33% said that they had experienced direct harassment or bullying because of their gender' (Pearson 2015). This shocking headline figure reveals the importance of understanding the role of gender in this context. The phenomena of 'crunch time' and the culture of long hours is both a cause and an effect of the institutionalized sexism in the industry (Haines 2004). As Dyer-Witheford and de Peuter (2009: 63) rightly point out this means that there are direct barriers like a 'glass ceiling', but also the pressure for contribution in terms of the 'classic invisible role of reproductive labor, covering the deficit of household tasks and emotional labor of which their exhausted partners are incapable'.

These kind of conditions are enforced on a workforce that does not have traditions of trade unionism. There are high levels of 'prestige' for working in game production, which 'means that many who work in the industry are prepared to work long hours, sometimes unpaid, and to put up with precarious terms of employment' (Kirkpatrick 2013: 108). Yet the fact that many of the major publishers produce games that 'are among the most formulaic – and hence planable – products in the business', and have not tried to overcome these instances of overwork, therefore 'points to an elementary economic fact: it is a good deal – a steal, in fact – for game companies' (Dyer-Witheford and de Peuter 2009: 60). These two instances, poor working conditions and institutional sexism, could provide the impetus for new forms of workplace organization. As Brophy (2006) argues in the example of WashTech (an attempt to organize precarious tech-workers at Microsoft), these kind of workers have a 'notorious aversion to collective organizing'. There are a range of barriers to organizing in the video games industry. The first is the 'powerful nonmonetary attractions', in comparison to other industries, no others have been 'as successful in generating an image of work as play'. This is captured in Dyer-Witheford and de Peuter (2009: 55) conceptualization of the emotional draws of 'creativity, cooperation, and cool'. However, these benefits of the work, particularly in comparison to other kinds of post-Fordist employment like call centre work, are not predicated on the negative components.

There are also more strategic barriers to organizing, which also prevent finding out more about conditions in specific workplaces. Non-Disclosure Agreements (NDAs) have become a widespread part of employment contracts in the industry (Lane 2016). In addition to this, research collaboration with companies tends to start with signing an NDA, precluding these kind of avenues for leading to more militant research methods. This has a number of detrimental effects on workers. The first is that signing an NDA makes it difficult to discuss work, whether in terms of dealing with the stress of 'crunch' time, leading to 'stories of developers working themselves into the ground and feeling unable

to discuss the problem for fear of social isolation from colleagues or even litigation from their employer'. The use of NDAs makes it difficult to discuss the negative parts of work with colleagues or more broadly to expose bad practices, the kind of activity that is often essential to the early stages of workplace organization. Yet what the use of NDAs also indicate is that information leaked by developers can now 'reach millions of people within minutes' (Lane 2016) and the importance that publishers place on stopping this from happening. As discussed earlier, the time sensitivity of major game releases emphasize the importance of management control over all aspects of development. Therefore, the NDAs also signal a weakness for management and how releasing information – or at least threatening to – is a potentially powerful weapon in the hands of workers.

Towards an inquiry

My research has so far provided a snapshot of the structure and features of the video game industry in the United Kingdom. This is not intended as an exhaustive study, but rather as an initial pre-inquiry phase to building a more detailed understanding of the dynamics of the industry. At this moment in time the production of video games has been identified by the political representatives of capital as a key growth area. It is likely that others are also watching its development and considering how rates of profit can be increased and the imperatives of capital further written into its activities. What I have argued is that Marx can offer more than a simple cameo for those seeking a critical understanding of video games. Reversing the perspective from capital to workers allows a much deeper understanding of the processes of video game production. Capital itself is continuing to reorganize, both on a national level and across the globe. The kinds of work that used to be common in the United Kingdom are being replaced with new forms, often without effective workers' organization. The analysis therefore has to begin from the understanding that 'virtual games are one molecular component of this undecidable collective mutation, which is revolutionizing life from the mines to the metaverse. In that sense, they are game with worlds to win' (Dyer-Witheford and de Peuter 2009: 229). Starting with games, this analysis can quickly move to take in global supply chains with complex mixtures of immaterial and decidedly material production.

The strength of a Marxist approach is that it gives primacy to the processes taking place at the point(s) of production in contemporary capitalism. While this has not been achieved here, it can be furthered with methods drawn from the workers' inquiry, situating workers themselves as in a unique position to understand the contradictions of modern capitalism. This provides an important corrective to the grand claims of reports on the industry, seeking instead to uncover the continuing importance of labour. This tendency to remove labour from the equation has been conceptualized by Scholz (2015) as 'digital black box labor'. The task of critical research today is to reveal these contradictions and analysing the labour process remains crucial for doing so.

This initial attempt at understanding the industry has identified two points of contestation. The first is the prevalence of 'crunch time'. These struggles over the length of time at work – indeed an important focus for Marx (1976) in the chapter on the Working Day – highlight how important labour remains for creating video games. In these workplaces new methods for motivating workers are being developed, providing a reminder of Braverman's (1999) analysis of Taylorism. The ways in which workers' subjectivities are played upon by management to raise their levels of exploitation are also being experimented with in different industries. The attempts to gamify the workplace, seen for

example in call centres, means these new workplaces risk becoming 'not Daniel Bell's dream, but Harry Braverman's nightmare' (Brophy 2010: 474). The second is the institutional sexism of the industry. These two could be converted into organizable demands in a workplace, yet the lack of traditions and rejection of collective organization remains significant obstacles to doing this. If the sector is to become as important as it is being touted to be, then equal access along with fair hours and pay are needed as demands. Otherwise the industry as a whole will continue to be shaped by the demands of capital.

The biggest challenge for embarking on some kind of inquiry into video game production is the prevalence of NDAs. These barriers to talking about work need to be challenged, not only from the position of strengthening workplace organization, but also for the damage they do to the industry overall. What is needed is further research attempts, not only from outside of the workplace, but those seeking to develop co-research projects – hopefully inspired by workers' inquiry – that challenge these NDAs and in the process reveal what happens behind the closed doors of the development studio. New ways to enquire into what Marx (1976: 279) called the 'hidden abode of production' are needed to do so. The development of technology has put many more tools in the hands of workers and researchers – now not limited to the postal survey that Marx (1938) originally used – and critical experiments with these could yield interesting results.

As games themselves 'tend to a reactionary imperial content, as militarized, marketized, entertainment commodities, they also tend to a radical, multitudinous form, as collaborative, constructive, experimental digital productions' (Dyer-Witheford and de Peuter 2009: 228). The critical analysis of games needs to understanding that there is a struggle both between these kinds of games, but also between labour and capital in the process of actually producing them.

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