Digital Labour and Workers' Organisation

Book Section

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Abstract

The rise of digital labour is changing how people work and provides new challenges for worker organisation. Beyond this, there is disagreement on what exactly constitutes digital labour and its impact more broadly. These processes are differentiated on a global scale, with different dynamics in the global North and South. This chapter address these questions in two parts, drawing on the Autonomist Marxist concept of class composition. First, it examines the technical composition of digital labour, looking at the organisation of digital labour process by capital. This covers four examples: customer service operators, software developers, outsourced moderation workers, and crowdsourcing workers – while also focusing on India and China. Second, it discusses the political composition of these workers, focusing on forms of resistance, struggle, and organisation. The example of software developers is considered here due to the role they play in creating and maintaining the software upon which other labour processes rely. The chapter argues that these components provide important insights into how capital is reorganising work through the application of digital technologies –these are situated as the result of class struggle, rather than neutral tools. It emphasises the potential of new forms of resistance and organisation in a digital context.

Questions

A. What is the nature of the labour organisations representing precarious workers and what are their strengths and weaknesses in advancing their interests.

Broadly speaking, there are two different forms of labour organisations that represent precarious workers at present. The first are existing mainstream trade unions. In general, there has been little orientation of these unions on organising precarious workers – partly because it is difficult for them to do so, and in part because precarious workers do not represent the core of their membership. However, in some sectors (like care work) where terms and conditions have been under sustained attack, these unions have members who now face increasingly precarious conditions. The strength of this form of organisation is a large membership and resources, particularly for fighting regulatory changes and legal challenges. However, the older forms of organisation represent a barrier to worker-led campaigns and rank and file democracy.

The second is new forms of base trade unionism that have been growing recently in some sectors of precarious work. For example, there has been a wave of militancy in the so-called "gig economy" at companies like Deliveroo. This resistance has been translated into organising with a range of new kinds of trade union organising: in the UK, the Independent Workers Union of Great Britain (IWGB) and the Industrial Workers of the World (IWW); in Italy, SI-COBAS; and in Germany, Freie ArbeiterInnen Union (FAU). These new experiments with organisation have won victories for these workers, building on the strengths of worker self-organisation. However, in comparison to mainstream trade unions, they are small organisations with little in terms of resources. A key challenge is the ability for this model to scale up, both within the sectors they are organising in and more broadly.

B. How do worker organisations in your chapter build collective identity among workers, within community, and broader working class.

The forms of worker organisation discussed in the following chapter are at an initial and experimental phase. However, there are important lessons that can be learned from the base unions described above. In order to build collective identity among workers, it is often necessary to go beyond the narrow economistic demands of mainstream trade unions. Instead, questions of power, self-management, and control can be much more effective for mobilising collective identities. When thinking about digital forms of work, the workplace itself has often shifted or at least been transformed. This requires a creative approach to finding points in which workers can meet up (both online and offline) to discuss, complain, and organise about work. An important lesson from the Deliveroo campaign in the UK has been to focus on the points at which people do meet (when waiting for an order, for example) and using that to build connections to organise. The combination of online communication tools and offline meetings can strengthen a campaign, lowering the barriers to entry and involvement. What is needed is to share these examples widely and think about ways they can be adapted into different workplace contexts.

C. What are prospects for the future

The wave of struggle in the "gig economy" shows that there are new and emerging ways to successfully organise – but more importantly prove that capital has not succeeded in extinguishing resistance in new forms of digital work. Instead by looking at this new class composition – first the technical and then the political – it is possible to trace the prospects for the future. When thinking about software development, this is a terrain of struggle that goes on to shape increasingly greater areas of work. But these challenges will not come from the abstract, but rather from the ongoing activity and resistance of workers in a range of workplaces across the globe.

Introduction

The aim of this chapter is twofold: first to trace the shifts taking place with the growth of digital labour, while the second is to develop an understanding of the changing practices of resistance and the possibilities of worker organisation. The focus is therefore on the emerging class composition – the combination of the technical (the organisation of the labour process by capital) and political composition (the forms of resistance and organisation in and against the labour process) – across a range of divergent contexts. The chapter will use, as this analytical focus suggests, a heterodox Marxist framework drawing on insights from autonomist Marxism.

The first section of the chapter begins with a discussion of what we mean by digital labour, connecting it to pre-existing forms of labour, drawing attention to both similarities and points of departure. This is important because the category of digital labour is itself contested, particularly around its conceptual boundaries. Rather than understanding the digital industries – if it is possible to demarcate that specifically – as a post-Fordist shift within the limited frame of the global North, this section seeks to understand how new forms of work emerge as part of a global labour arbitrage and are thus connected to processes taking place in the global South. This section examines the shifts at the macro-level reorganisation of labour and capital both within and outside of the digital industries, drawing on examples from customer service operators, software developers, outsourced moderation workers, to precarious crowdsourcing platforms – to illustrate the dynamics of labour reconfiguration, looking particularly at India and China. Attention is paid to the imperatives of capital

in this process: the new demands, the complexities of managing digital labour processes, and the way in which capital becomes deeply embedded in new technologies.

The second part of the chapter moves onto the political re-composition of workers engaged in digital labour struggles. This section focuses on the possibilities of organisation software programmers. The successes of capital in the management and exploitation of digital labour provides lessons that can be applied elsewhere, thus it is also critical to find out what experimentations of resistance are being attempted by workers too. It is important to understand how software and the workers who make and maintain it is shaped by class struggle. The chapter then concludes by seeking to connect the political re-composition of software programmers to the broader division of labour that is involved in digital capitalism.

Digital Labour

Capitalism has been, and continues to be, marked by the 'constant revolutionising of production, uninterrupted disturbance of all social conditions, everlasting uncertainty and agitation' (Marx and Engels, 1848). Or, in other words, capitalism is constantly changing. Previous structures or patterns of organisation that were once dominant become replaced with new forms, as 'all that is solid melts into air.' It is important to understand that these dynamics, particularly those related to the introduction of new technology, do not operate independently from social relations and class struggle. These sweeping changes, discussed by Nick Dyer-Witheford (2015:11) as 'extending from game studios to electronic assembly lines, conflict mineral mines and digital waste dumps.'

The most notable trend for understanding the global scope of worker resistance and the reconfiguration of labour is the shifting global labour arbitrage. Historically, manufacturing has mainly shifted from the global north to the global south, with processes of deindustrialisation in the UK, Western Europe, and the USA. While manufacturing has by no means collapsed in these areas (in part due to significant increases in the productivity of labour), there have been large increases in manufacturing output in China and India, for example. This experience in the global north has been met with attempts to theorise the shift from industrial labour to new forms, for example, 'immaterial labour' (Lazzarato, 1996), 'affective labour', (Hardt and Negri, 2004), 'cognitive labour' (Boutang, 2011), and 'emotional labour' (Hochschild, 2012), to name a few. While there is crossover between many of these terms, they point towards two important phenomena that are not necessarily the same. The first is digital labour and the second is the growth of service work. The service industry or the existence of services within different industries is hardly a new phenomenon. For example, at the time Marx was writing there were more domestic servants than textile factory or metal workers in the UK (Jonna and Bellamy Foster, 2016).

The second phenomena that is identified is the increasing digitalisation of labour. This has created three interrelated changes for labour: new forms of digital labour, involved in the writing and maintenance of software, which can be conceptualised as labour creating the digital; new kinds of labour which have been created to fulfil new tasks in a digital environment, for example social media moderation or search engine optimisation, which can be understood as labour for digital platforms; the transformation of pre-existing forms of labour, for example the way in which office work has changed through the application of technology, which is labour using the digital. These broad distinctions within digital labour provide a sense in which exploitation and resistance can be better understood. At the core of digitalisation is a push towards automation, both from workers and capital. Digital technology – which are of course designed, developed, implemented, and used by

people within the antagonistic relationship with capital – holds the potential to allow greater autonomy of workers, freeing up time to spend on more interesting pursuits. Conversely, for capital automation holds the potential for even greater surplus value extraction and the possibility of expelling more workers from the process.

It is here that the contribution of the Italian Autonomist tradition is particularly useful, starting with an understanding of how capital attempts to 'incorporate the working class within itself as simply labour power', while the 'working class affirms itself as an independent class-for-itself only through struggles which rupture capital's self reproduction' (Cleaver, 1979:66). The dynamic of the autonomy is expressed as 'workers demand[ing] freedom from capitalist regulation' resulted in the transformation of post-Fordism as 'capital did the same thing, but in a reversed way' (Berardi, 2003). This can also be found in the emergence of video games under capitalism (Dyer-Witheford and de Peuter, 2009; Kirkpatrick, 2013), with their beginnings in a refusal of work and a repurposing of business or military computers. What is interesting here is to try and connect these 'lines of flight from authority' that currently 'are completely solitary.' Otherwise 'the refusal of work' is 'in itself . . . empty' (Hardt and Negri, 2001:204).

The struggle between capital and digital labour oscillates around capital's need to 'balance' its 'insatiable need for a stream of innovative ideas with the equal strong imperative to gain control over intellectual property' and workers (Huws, 2010:504). One example of this is the push towards 'automatic programming', seeking to take the automating part of coding's instructions and applying it back onto the process of creating software, aiming to achieve the 'managerial ideal of ordered, assembly line software development' (Ensmenger & Aspray, 2002:155). This threat of automation is often carried by headlines about robots arriving to replace workers, seen for example in the recent statistic that just under half of all jobs are at risk of automation (Frey & Osborne, 2013). What is happening is a continuation and deepening of the process identified by Braverman (1998:78), that once 'mental labour is first separated from manual labour', it 'is then itself subdivided rigorously according to the same rule.' This can be seen with the rapid rise of high-frequency trading algorithms in finance. These algorithms, or 'mathematical processes that allow machines to learn and improve their performance', are formed through a process by which 'workers' knowledge is first routinized, then codified and transferred from its variable (human) component to its fixed, machinic form' (Dyer-Witheford, 2015:178).

There is a risk of overemphasising the importance of digital technology, particularly as it becomes more and more ubiquitous in our lives. As Bifo argues, software code itself is not an autonomous force, as 'in the beginning someone is writing the code, and others are supposed to submit themselves to the effects of the code written by someone' (Berardi, 2013:ix). Therefore it is important to argue that 'the pragmatic effects of the code are not deterministic, as far as the code is the product of code writing, and code writing is affected by social, political, cultural, and emotional processes.' It emerges from and is shaped by class struggle, while also being used an intervention into class struggle. The process is not uncontested, with 'hacking, free software, WikiLeaks' as examples of possible 'lines of escape from the determinism of code' (Berardi, 2013:x). It is vitally important to stress that digital software is not neutral: although it is written by workers (and depends upon technology made by other workers), like industrial machinery, it has the imperatives of capital inscribed deeply within it. This does not mean that alternative uses are not possible, but like the seizure of factories, requires the overcoming of capital to do so. What is needed is to 'reveal some of the contradictions over production involved in working with code, in parallel to labor conditions and class struggle more broadly' (Cox, 2013:40), connecting digital labour across global supply chains to understand new forms of resistance and workers' organisation.

Tracing the shifts in production

Over the last two decades, outsourcing has become a prevalent relationship between the global north and the global south. Gartner, a business analyst firm, argued in 2003 that offshore outsourcing was a 'must do' for IT directors in Europe, citing the imperatives to reduce costs that the process involves (Huber, 2003). Call centres have become the most symbolic (or even audible) example of the trend for outsourcing (Woodcock, 2017). There were limited examples of trade unions responding to the threat of outsourcing in the UK – for example, Prudential insurance cancelled its initial plans – but large companies like BT have followed this strategy (Taylor and Bain, 2004). Despite the outsourcing of functions of the telecommunications industry (or the telecommunication functions of other industries) there are important parts that cannot be outsourced. For example, in 2010 in the UK, BT workers in the Communication Workers Union (CWU) rejected a pay offer and 50,000 workers were balloted for strike action. Although the strike did not go ahead, this could have led to thousands of engineers – and the call centre workers that customers rely on to reach them – refusing to support BT's network (Flinders, 2010). The risk of network failures during the strike could have had significant impact. As the head of public affairs at the Federation of Small Businesses explained, 'if BT services go down, there could be lost business which could be fatal for some' (quoted in Flinders, 2010). A similar struggle broke out in the USA recently, with 39,000 Verizon and Verizon wireless workers taking strike action. The demands focused on offshoring of call centre workers, outsourcing of contractors, and attacks on the conditions of workers who install and maintain the communication network (DiMaggio, 2016).

Business process outsourcing

The wider trend of Business Process Outsourcing (BPO) has often focused on India and the significant growth of this kind of industry. The combination of the processes of 'transnationalization' and 'liberalization' have allowed the 'reach of capital via global markets into correspondingly open national markets' (D'Costa, 2005:34) like India. The growth of the IT focused Business Process management or IT-BPM (IT-Business Process Management) now employs over 3 million people (Barnes, 2015). It has led to the creation of an 'emergent middle class' (D'Costa, 2005:3). The 'transnational interactive services industry', with call centres in particular, is transforming both the conditions and aspirations of workers involved (Murphy, 2011:1). It also involves the added pressure of performing 'authenticity' to customers located in different geographical locations (Mirchandani, 2012), and the 'depersonalised bullying' of the workplace environment (D'Cruz and Noronha, 2009).

The relocation of call centres and other forms of outsourcing – for example, from Britain to India – follows linguistic lines that trace the history of imperialism, has become a common tendency (Huws et al., 2001). As well as physical relocation, this also entails virtual outsourcing, for example, with 'firms routinely reroute calls from UK to Indian centres when UK operators are busy, at night or weekends, or when overtime rates apply at home' (Glucksmann, 2004:807). The viability of this kind of outsourcing is both 'organizational' and 'spatial', taking in 'industrial and organizational divisions of labour' which 'enmesh with global divisions of uneven development' (Glucksmann, 2004:801). The companies that first adopted these methods 'gain competitive advantage through technical innovation and the enhanced creation and realisation of value', but 'imitation by others can see this advantage eliminated as the benefits are shared by all.' Once these become used more broadly, the 'only way to continue to compete is to use the, now established, work system more intensively' (Ellis

and Taylor, 2006:6). This tendency of relocating call centres to India 'should be regarded as an extension, however dramatic, of the spatial dynamic that is inherent in the call centre project' (Taylor & Bain 2004), and one that 'can not be abstracted from the dynamic of capitalist accumulation' (Ellis and Taylor, 2006:6).

Despite the purported benefits of a growing service economy in India, there are signs of emerging class struggle. The Times of India ran an alarmist headline that 'the last bastion has been breached', referring to the reports of successful unionisation among IT workers employed by Tata Consultancy Services, the largest IT company in India (quoted in Barnes, 2015). Similar arguments to those against unionising IT workers and programmers in the global north (which will be discussed in more detail later) had been common beforehand. There have, however, been efforts to organise in the IT industry in India. As Narayan Ram Hedge, who works for the Union of Network International in India, argued, the 'IT industry professionals in India are "cyber coolies"' with clear concerns to organise around, but there is a need to 'convince them on the need to form a union' (quoted in Iype, 2005). This is complicated by the current political situation in India, with the Modi government's hostility toward trade unions, in addition to the 'centrality of the IT sector to industrial policy and the power and wealth of leading IT industrialists' (Barnes, 2015). By no means does this make it impossible, rather that it is a difficult conjuncture to organise in, perhaps also stressing the need to do so.

Although it is easy to focus on the high-tech industries of BPO in India, Barnes (2015) also points out that there are much larger industries in India – for example, garments, construction, and agriculture – that remain relatively unorganised. There are centres of union organisation within 'old industries like steel production, shipping, and food distribution', but Ness (2016:89) also confirms unions 'are all but non-existent in new sectors of the economy that are recipients of foreign capital: internet technology, business services, construction and new auto and electronics manufacturing installations.' A good example of this is the e-commerce industry which connects low paid workers with capital via mobile applications. Platforms like Amazon, Alibaba, and Uber do not produce something new, rather than provide a new way to connect people (buyers and sellers) with products. In reality, these are not 'immaterial networks . . . ideal virtual and decentralised marketplace[s]', but involve 'a massive concentration and centralisation process.' The platforms themselves rely on IT workers and logistics networks, the 'material backbone' of these companies, and the 'massive share-boom' that is fuelling their expansion. However, in countries like India, there has been a 'lack of investment in infrastructure by state and capital', leading to congested road networks and precarious logistical arrangements (Angry Workers of the World, 2015). This is exemplified in the complex text avoidance/evasion measures of tech companies, resulting in American businesses currently hold $1.9 trillion in overseas cash surpluses. This money is concentrated in digital technology firms, with Google having $80 billion in cash, for example (Davidson, 2016).

The transformation of China

A second important global change can be found in the transformations that China has been through since the 1980s. With 'the arrival of global and private capital into the export processing zones', China became 'transformed into a market economy under the wave of industrial relocation from advanced capitalist countries to the global South' (Ngai, 2016:5). The electronics and computers that digital labour (whether in the global north or increasingly outsourced to the global south) relies upon are increasingly manufactured in the global south with China as a major exporter. Chinese workers make up 29 percent of the world total and the costs are 'as low as one-sixth that of Mexico and one-

fortieth that of the US' (Ngai, 2016:6). Over the past thirty years, China has continued to transform as 'overproduction, increase of productivity, decline of interest rates, and technological innovation have created a shift of capital flows from manufacturing industries to property and financial sectors on the one hand', resulting in a widespread changes, 'but also increasingly the concentration of capital in manufacturing sectors such as electronics and car industries on the other' (Ngai, 2016:3).

These processes are exemplified in the rise of electronic manufacturing centres like the Shenzhen export processing zone. In particular, there has been attention paid to the sprawling Foxconn factories that make components for consumer electronics like Apple's iPhone. After a spate of worker suicides at the plant, the factories owners installed anti-suicide safety nets (Chakrabortty, 2013). The harsh conditions in which the 400,000 workers produced components became well known, with multiple shifts ensuring production throughout the day and night. Chan (2013) argues that the conditions are shaped by a combination of the company trade union and Government policies, but that there is the 'emergence of an alliance of workers, students, scholars and transnational labour movement activists who are campaigning for Chinese workers' rights' (Chan, 2013:84).

The contradictions of state capitalism in China are indicated by the fact that ACFTU (All-China Federation of Trade Unions) is the world's largest, with around 288 million members. The reality of this figure is that 'the vast majority of union members either do not know that they are union members or have little faith in the ability of the union to represent their interests.' Moreover, 'the majority of enterprise trade unions are controlled by management and represent the interests of management' (CLB, 2016). There are very few examples of trade unions actually supporting workers against management in China, for example at Walmart in Changde in 2014. While the right to strike was removed from the constitution under Deng Xiaoping, there is 'no legal prohibition on workers taking strike action.' There are widespread (if rarely publicised in the global north) strikes and protests across China. While the official trade unions are clearly not vehicles for worker self-organisation, over eighty civil society organisations have been established to support workers struggle, particularly focused in Guangdong. These 'organizations have taken the lead in helping workers formulate their demands, elect bargaining representatives, come up with a bargaining strategy and maintain solidarity among the workforce.' There have also been examples of successful use of 'increasingly powerful tools provided by social media to put pressure on trade union officials in the region to support workers' legitimate demands' (CLB, 2016). The emergence of 'this new class and its resistance politics' has the power to reshape class struggle on a global level (Ngai, 2016:2).

Crowdsourcing

In addition to the examples of India and China, there has been an intensification of the outsourcing of digital work through crowdsourcing platforms. Crowdsourcing was a term originally coined by Howe (2006) in Wired as 'the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call.' However, as capital has increasingly understood the benefits of this kind of organisation, it can be understood as 'a third generation sourcing ecosystem', providing a way to access a pool of virtual worker for various tasks (Kaganer et al., 2013:23). There has been a widespread growth of microwork platforms, like Amazon Mechanical Turk and Upwork, which take large projects and fracture them down into much smaller parts that a crowd of workers can simply and quickly complete. This process 'relies on dyadic relationships consisting of one buyer, one supplier and a well defined final deliverable' (Kaganer et al., 2013:25). The workers cannot

collaborate on these discrete tasks – which Amazon describes in somewhat dystopian terms as HITs (Human Intelligence Tasks) – and competition through bidding is used to drive down costs even further. This kind of microwork is deeply alienating. The individual labour process becomes technologically disassociated and obscured from the overall project. Amazon's 'crowd sorcerers work with coolness and the spectacle of innovation to conceal the worker' (Scholz, 2015). Microwork platforms therefore work like a 'black box', a 'system whose workings are mysterious' (Pasquale, 2015:3). As Scholz (2015) has argued, the labour processes involved can therefore be understood as 'digital black box labor.'

The growth of these microwork platforms has allowed labour markets to be more easily connected across geographic borders. As Mark Graham (2015) has argued, there are now 'millions' of workers in 'low-income countries like Kenya who can use online work to transcend some of their local labour market's constraints.' In a way similar to the business process outsourcing described above, microwork is allowing a deepening of the division of labour with 'a new model of work called "impact sourcing."' The claim is that businesses in the global north will 'outsource work to disadvantage people in some of the world's poorest places.' While the business gain access to very low paid labour, this bargain is said to entail training and opportunities for the new workers pulled into this technologically enabled global marketplace. The popularity of this idea has seen the governments of Nigeria and the Philippines, for example, setting up official programs to encourage people to join these platforms. However, these global marketplaces 'force many workers to desperately try to underbid each other to attract short-term contracts. And, because contracts are largely unregulated, stories of discrimination and exploitation abound.' The bargain offered by capital in the global north therefore does not seem to come with the promised benefits for workers in the global south.

There has been a longer trend of outsourcing parts of the production of video games. Parts of the process are subcontracted to 'third-party developers outside the geographic core of capital.' The 'tasks that are farmed out include "porting" existing games to additional platforms, rote programming, and made-to-order artwork.' What began as pushing industrial production out to the global south, now increasingly involves the immaterial aspects too as the labour process is further divided. There are now game studios 'from the former Soviet bloc to the Indian Subcontinent' and that 'this globalisation of immaterial game labour reminds us that the North's current monopoly on high-tech jobs is not ironclad.' However, it is important to note that it is the lower skilled and less well-paid parts of the labour process moving into the global south, while profits are retained in the global north (Dyer-Witheford & de Peuter 2009:50).

Now within the games themselves there is an increasing division of labour; 'playbor' (Kücklich, 2005) for some, and monotonous work for others. This form of work is transcending the boundaries between the virtual and the real economy, with the growth of 'gold farming' and 'real-money trading' in massively-multiplayer online games (Heeks, 2009:4). It is estimated that there are at least 100,000 full time gold farmers in China, accounting for 80% of the global total (Vincent, 2011). Although anyone with an internet connection can 'engage in this sort of digital production and consumption, the actual practices have distinct geographies.' For example, with a large flow of trade between China and the USA (Graham, 2014). Not only have there been exposés of sweatshop conditions for these workers, but also examples of prisoners being forced to play online games to build up credits or items for the guards to sell. This prison-industrial-game complex is arguably 'even more lucrative than the physical labour that prisoners were also forced to do' (Vincent, 2011).

The reality of much of this microwork is very low paid and repetitive work. For example, Graham (2015) describes common tasks like 'search engine optimisation' or the writing of short reviews. In

addition to crowdsourcing platforms, new kinds of labour are being pulled in to support the digital economy. The rise of web 2.0 platforms like Facebook and YouTube has drawn users into a process of 'produsage' (Bruns, 2008) in which they both use and produce content. While much research has focused on the role of users' unpaid labour in creating value for these platforms, less attention is paid to the new low-paid roles needed for this process. Large numbers of workers are now employed to 'commercial content moderation (CCM)' work needed to validate user-generated content. The 'interventions of CCM workers on behalf of the platforms for which they labor directly contradict myths of the Internet as a site for free, unmediated expression.' Their labour process involves the repetitive task of viewing 'racist, homophobic, violent, and sexist content' deemed too unpleasant or disturbing for regular users (Roberts, 2016a). This supportive strata of exploited workers can also be found with the 'techno-trash' generated in the digital economy. Like the workers cleaning internet platforms, large numbers of workers are involved in the recycling of e-waste, 'increasingly undertaken' in the same 'sites like the Philippines' (Roberts, 2016b). Both of these kinds of work are deemed unpleasant, shifted onto workers in the global south for the benefit of consumers in the global north,

Challenges for workers' organisation

The shifts and transformations discussed above have important ramifications for the possibilities of workers' organisation. In order to understand how these new digital workers – understood across a range of roles, whether programmers directly involved in creation of the digital to other supportive roles – this shifting global division of labour is important. While the specialised and better paid programming roles used to be mainly based in the global north, they are increasingly been shifted – whether through outsourcing or more generally – to the global south. As software became more important to capitalism, 'U.S. power was notably deployed in order to generalize capitalist imperatives in and around world communications.' This meant that the internet has become 'an unprecedentedly wide platform for driving capitalist imperatives into new industries, and restructuring existing industries' (Schiller, 2015).

There has been little to no history of trade union organising among software programmers. There are a range of often cited reasons: conditions that are relatively good with high pay, stereotype of programmers as individualistic geeks and loners, or the general decline of organising across different industries. However, Finley (2012) argues that 'maybe unions are failing in tech because they're not addressing the real issue: giving developers more control over their work life.' The focus of contemporary trade unions on purely economistic demands like better pay or pensions, means that many of these questions are left unanswered. The 'frontier of control' in the workplace between workers and capital is therefore left uncontested in many cases (Goodrich, 1975). When considered in these terms, there are clearly organisable demands around autonomy. Unrealistic deadlines or the ubiquitous use of crunch-time towards the end of projects are demands that previously have not been posed in this way as 'historically developers have had two options for dealing with bad management: find a better job or found a startup.' However, 'worker self-management' – or at least contesting control from management – 'would offer a third options — give the developers control over their own work' (Finley, 2012).

It is no surprise that trade unions are not a popular option for software developers – or many other groups of workers across industries. The recent history of trade unions, particularly in the USA, has seen unions negotiate wages and benefits on behalf of workers. In the worst cases this involves the use of no-strike clauses. Alongside the bureaucratisation of trade unions this risks workers seeing

collective workplace organisation as something that 'takes away their workplace freedom, not something that gives them the ability to have more control over their day to day work life' (Finley, 2012). This is confirmed by Caughley (2001) who argues that 'while certainly enjoying relatively good incomes, are not at all hostile to union organising, and that there is now, more than ever, a real need for us to get organised.' This need for organising has been indicated in the EA_Spouse open letter that exposed the working conditions at Electronic Arts from the perspective of the partner of a software developer (Gamasutra, 2005).

There have been arguments made that the software industry, particularly in videogames, that there is the possibility for a wave of unionisation similar to the move industry in the 1930s and 1940s. The main difference is 'that Hollywood unionized, and the game industry is still only talking about it' (Gamasutra, 2005). As Tara McPherson has argued, in the 'Hollywood's studio era was a lot of independent producers who slowly consolidated into a few key players - we call them the Five Majors - who gained a monopolistic control over distribution.' This led to them being able to control what kinds of products were made and how much workers would be paid. McPherson continues to argue that this is 'being replayed pretty dramatically in the game industry.' In Hollywood workers organised in the Screen Actors Guild and the Writers Guild of America in their struggle against managers. The same arguments that were used in Hollywood – that unions are not suitable for this kind of work – are now being rehashed for software programmers. McPherson argues that the big publishers in the games industry will not 'benevolently change today's abysmal work conditions without pressure. They will make small changes, but not much else, if the threat of unionization seems real' (quoted in Gamasutra, 2005).

One possibility for workplace organisation was the proposed CyberLodge. Although the project itself is no longer running, the founder argued that there was a 'need to strike a balance between the need to present a reasonably coordinated message and the need for a highly flexible, portable organization that lets tech workers work the way they do today', seeking to combine the ethos of open source software with a trade union of sorts (quote in Miller, 2003). However, the founder Ian Lurie, was an employer, rather than an employee. While this employee association type model is clearly problematic, it also highlights that a lack of organisation is recognised across the industry. Other representatives of capital in the industry are much more hostile to the prospect of unionisation. Adam Levin, a labour law attorney who often represents employers in the industry, argues that 'unionization frequently means increased labor costs, which does no one any good' (quoted in Gamasutra, 2005). This argument against unionisation – despite missing the fact improved wages or conditions would benefit workers – misses the fact that capital is extracting huge profits and reducing this would not damage the viability of the industry overall. Similarly, the executive VP of human resources at EA, warned that 'there will always be people who want to step in and take a piece of the pie or get in the middle of things without contributing to the growth of the business' (quoted in Gamasutra, 2005). Now while this could easily be referring to the layer of managers, it is instead referring to trade unions, signalling the hostility present in the industry. That hostility is also a sign of the potential power that organised workers could have.

A range of worker orientated forms of organisation have also been proposed. For example, the now defunct IT Workers Alliance (Caughley, 2001), the International I.T. Workers Union – that no longer exists but was launched on International Workers Day in 2007 (Babylonian, 2007), or the more successful, and still running, WashTech. Formed in 1998 by contract workers at Microsoft, WashTech is affiliated with the Communication Workers of America, and organises 'high-tech workers from Silicon Valley to Boston' (WashTech, 2009). One of the approaches that WashTech has taken is to 'reach out' to workers 'via online forums and job boards' to explain 'the advantages of joining a

union and what we have to offer because not a lot of white-collar workers understand the union process' (quoted in Gamasutra, 2005).

There has also been the establishment of the Communications, Computer, and Software Workers Industrial Union 560, a branch of the Industrial Workers of the World (IWW, 2016). Although the IWW is far from a mainstream workers' organisation, it has experienced growth with recent successes organising at Starbucks in New York (Finley, 2012) and cleaners in London (Kirkpatrick, 2014). As Immanuel Ness (2014:6) argues, 'in the early twentieth century the IWW reflected the organizational aspirations of dispossessed exploited workers, mass production workers who recognized their power to exercise control over industry and represented a tangible means of seizing control over capital through militant and self-directed representative unions.' The potential to combine this history with the new challenges of digital labour holds a lot of potential. As Steve Ayers, a programmer and IWW member, points out, the 'stereotype of developers as loners is not entirely accurate', pointing to the example of 'open source development', the 'collaborative endeavor meant to bring about a collective good.' The widespread development and use of open source software is described by Ayers as 'communism with a lowercase "c"' (quoted in Finley, 2012).

Another important consideration to add to this is that the potential power of programmers has grown as software has become increasingly enmeshed with capital, particularly with the history of 'sabotage' in the IWW (Ness, 2014:6). There are 'all kinds of stories about developers planting viruses, destroying data, stealing secrets and causing all kinds of electronic mayhem after being shown the door' (Ramel, 2011). For example, one Unix engineer who was fired from Fannie Mae, responded with a 'logic bomb.' This 'was designed to propagate throughout the Fannie Mae network of computers and destroy all data, including financial, securities and mortgage information.' Unfortunately, the script was found and the engineer was sentenced to almost three and a half years in prison (quoted in Ramel, 2011). Similarly, what was believed to be the first ever computer virus – or at least the first to be discovered and prosecuted over – was designed by a programmer who was fired from the Texas securities firm USPA&IRA Co.' (Ramel, 2011). What these examples highlight is that programmers now hold a huge amount of power, particularly as managers are likely to have little or no understanding of the software they rely upon. This is particularly the case in finance, with the dominance of algorithmic trading and servers holding a wealth of data.

Conclusion

So far in this chapter we have discussed what is meant by digital labour and traced how the new global division of labour is taking shape across the world, taking in software developers, outsourced IT workers in India, Chinese migrant workers, and microworkers logging onto virtual platforms. The argument presented in this chapter is an attempt to move beyond the false dichotomy of "old" and "new" – as well as to some extent "offline" and "online" – forms of organisation. New forms of digital labour which became widespread in the global north are now being outsourced and shifted into the global south, along similar lines to the movement of industrial manufacturing. Although the chapter has focused on the potential for resistance and organisation amongst software programmers – a kind of labour that is predominantly focused in the global north – it is a challenge to understand how the political re-composition of this group of workers relates to other forms of labour. Programmers develop and maintain the software and platforms that other forms of labour require, whether to log on to microwork platforms or to run on the hardware produced in electronic factories. There has not been a history of militant worker struggles with this sector, but as the example in the videogame industry highlights, this is not guaranteed to continue.

The importance of understanding how the struggles of software programmers can be connected to other workers is also about interrogating the role of technology under capitalism. Instead of dreaming about how technology can be repurposed after capitalism (which often involves a failure to consider how or why capital will be overcome), there needs to be a focus on how technology can be used in the here and now. As Marx and Engels (1848) argued:

Now and then the workers are victorious, but only for a time. The real fruit of their battles lies, not in the immediate result, but in the ever expanding union of the workers. This union is helped on by the improved means of communication that are created by modern industry, and that place the workers of different localities in contact with one another. It was just this contact that was needed to centralise the numerous local struggles, all of the same character, into one national struggle between classes. But every class struggle is a political struggle. And that union, to attain which the burghers of the Middle Ages, with their miserable highways, required centuries, the modern proletarian, thanks to railways, achieve in a few years.

Given this was written almost one hundred and seventy years ago, the potential of technology greatly overshadows the railways of the time. There is the possibility of connecting of workers with different labour processes and in different locations across the world, whether directly involved in digital work or not. Crowdsourcing provides a good example of this: capital is experimenting with a way of integrating labour into a global market, drastically driving down wages and conditions as isolated workers compete against each other on a 'black box' (Scholz, 2015) platform. Yet, there is 'nothing inevitable about the current state of affairs.' This 'work is still being done in real places' by real workers. What is needed is to reassert that workers 'still have the power to . . . if needed, disrupt the production of digital work' (Graham, 2015).

Rather than posing a false dichotomy between the "online" and the "offline", new technology can be used to supplement and facilitate (and not replace where it is still a possiblity) face-to-face organising. In the case of crowdsourcing, where workers may be located thousands of miles from each other, the example of the 'Turkopticon' project – a piece of software designed to help microworkers collect information about work and discuss with each other – provides one way that software can be used to intervene in class struggle (Irani and Silberman, 2013). As Dyer-Witheford (2012) points out, ever 'since hackers led digital systems on a line of flight from their military origins the Internet has had an ambivalent political virtuality.' But new technology can form part of 'an electronic fabric of struggle', playing a political role (Cleaver, 1995), as well as providing new ways to monitor and supress. As the wave of struggles from Occupy to the Arab spring has shown, 'the crucial vector is the relation of networks to a workplace' (Dyer-Witheford, 2012). Mass protest and new movements have the potential to spark a new wave of workers' organisation. As capital seeks to reorganising along a new global division of digital labour, so too will workers. The key is understanding how workplace conflict has been changed by digitalisation and what new forms of resistance and organisation – in addition to traditional methods – will emerge in the political re-composition of the working class.

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