The industrial relations of China's internet industry: Politics, technology, and labour activism

Hong Yu Liu

Trinity Hall

Department of Sociology, University of Cambridge

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by Hong Yu Liu

Thesis abstract

This thesis is organised around a collection of articles on the work experience of technology workers in China's internet industry. It adopts a pluralist industrial relations approach and comments on themes that go beyond the Marxist tradition of labour studies in sociology. Both macro- and micro-angles are deployed in the investigation of a leading Chinese internet company, Digitech (pseudonym); a separate case study of Alibaba also is included. Drawing on qualitative methodologies – including 61 interviews, workplace observations, policy documentation and analysis – this thesis investigates the work experience of China's technology workers, particularly with regard to how this experience is affected by government policies and the implementation of digital management technologies in the workplace. It also explores motivations for collective action by technology workers and the challenges they face in reality.

Chapter 1 introduces the theoretical tradition and explains the benefits of the pluralist industrial relations approach used in this research project. It also gives details of the research design and methodologies, including considerations of research ethics during the design, fieldwork and write-up stages of this doctoral project.

The empirical chapters follow. Chapter 2 argues that the Chinese government plays a significant role in shaping the collective work experience in business reality by promoting competition within the business sectors. It also finds that the censorship of online labour activism and ambiguity in court decisions have lowered the interest of technology workers in organising and defending their rights. Chapter 3 documents how technology workers are managed through digital technology and details the impacts of this management approach on their working and living conditions, namely an increase in work intensity and an intensification of competition among workers. It also shows that workers gain higher incomes but proportionately lower shares of the gains from their increased productivity. All of these characteristics contribute to a new form of digital Taylorism. Chapter 4, a case study of the

latest example of labour activism in China's internet industry, argues that despite the Chinese government's expanding efforts to exert authority over society, technology workers remain militant in defending their rights against workplace sexism.

Chapter 5 reflects on the research methodologies deployed in this study, arguing that the state control and surveillance of citizens on both the physical and online terrain can have important yet scant-discussed implications for the conduct of academic fieldwork. Lastly, Chapter 6 concludes the thesis by revisiting the industrial relations system and job quality in China's internet industry. It also provides recommendations for policy and academic communities, presents some limitations of the current research, and describes some directions that might be taken by research based on the foundation built by this dissertation.

Keywords Internet Industry, China, pluralist industrial relations, digital management, labour activism

Publications and Work in Progress

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Liu, HY (2022b) Reflections on conducting fieldwork under digital surveillance: Investigating the labour politics of China's tech industry. *Journal of Contemporary Asia, 52*(1): 152–162.

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Preface

To begin with, the author would like to note five stylistic choices that appear throughout this thesis. First, Chinese names begin with the family name, followed by the given name (e.g., the Chairperson of the People's Republic of China, Xi Jinping). This style is commonly used in academic writing and publications.

Second, pseudonyms for participants are used throughout, to protect everyone involved. English pseudonyms (e.g., Chris, Ben) are used instead of Chinese pseudonyms (e.g., Zhang Xueyou, Liu Dehua). This is because Digitech employs more than 100,000 workers, and this modification can prevent accidentally using a real person's name as an interviewee pseudonym, which might cause that person troubles. At the same time, the author endeavoured to maintain the essential narrative truth of what is presented.

Third and similarly, the organisation name is also pseudonymised: 'Digitech' and 'DigiBuy' are the same organisation, but different pseudonyms are used in Chapters 2 and 3. This effort is intended to prevent revealing too much information about the organisation to external readers.

Fourth, the terms "tech industry", "technology industry" and "internet industry" are used interchangeably in the chapters (2, 3, 4 and 5) that have been published, due to the preferences of various copy editors. For consistency, however, this thesis will use the term "internet industry" throughout and refer to people who work in the internet industry as "technology workers".

Lastly, third-person narrative is used consistently throughout this thesis, as it is preferred by academic journals in industrial relations, and British English style is generally privileged. References used are listed at the end of each chapter, and their styles are different among the chapters, as they were published by journals with varying style guidelines. None of this affects the academic content presented in this thesis.

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Chapter 1 Introduction and theoretical motivations

1.1 An intellectual inquiry into China's technology industry

With a large and steadily growing workforce, the digital technology industry has become one of the key economic pillars in China today. Right after the economic reform and the implementation of the open-door policy in 1978, the Chinese government began its project of 'informationalisation' in the 1980s (Law Info China, 2009) and, since then, it has massively invested in the technology sector, yielding software and appliances for both civilian and military purposes. After four decades of effort, most recently supported by the government's Internet Plus and China 2025 policies, China is an international leader in developing communication technologies, including big data, cloud computing, the Internet of Things, blockchain, artificial intelligence, and 5G communications (China Briefing, 2022).

According to a report issued by the China Academy of Information and Communications Technology (CAICT, 2021), the digital economy reached US$7.1 trillion (CNY 47.94 trillion) in 2021, ranking second after the United States. Statistics also show that the digital economy's share in the national GDP, measured by the combined value of technology products and integrated digital inputs, reached 39.8 per cent in 2021, up from 20.9 per cent in 2012 (China Daily, 2022). Behind this economic miracle, 16.77 million technology workers fuel this skyrocket. In terms of salary, the average programmer in China earned more than CNY15,000 per month in 2018, which is significantly higher than the national monthly average salary of about RMB4,000 (National Bureau of Statistics, 2019).

Beyond exceptionally high earnings, technology workers in China are also well-known for their extremely long working hours and a 'work-to-death' ethic. Numerous news reports document burnout in the tech sector, often due to so-called "9-9-6" scheduling (working from 9am to 9pm, 6 days per week). Some even collapse at work, having literally worked to death (Reuters, 2021; Guardian, 2022). This management approach, however, should not be regarded as a phenomenon unique to China. Due to the introduction of 'going-out' initiatives by the Chinese government (Tang, 2020), with more and more acquisitions initiated by Chinese tech companies and their expansion overseas (Jia and Winseck, 2018), this hazardous work ethic is spreading from China to the rest of the world. For example,

recent news reports (Financial Times, 2022) revealed that the Chinese digital enterprise ByteDance (the parent company of TikTok) spread the "996" practice to its London office, causing extreme pressure on workers and consequentially forcing employees to quit their jobs.

As a researcher with a strong interest in the sociology of work, this phenomenon has sparked my curiosity: in the face of this spectacular economic development over the decade, my puzzle is to discover the role of workers in the process: what is their experience, and how is large-scale economic change related to social changes in China? As Karl Marx (1967[1867]) has stressed, workers have a privileged historical role in advancing social change in capitalism. Even as labour–capital relations have become increasingly complex in the digital economy, workers remain 'agents of change' in contemporary China (Pringle, 2015).

Marx believes that exploitation in capitalist production leads workers to struggle for improvements in wages and working conditions; collective consciousness formed during such experiences gives rise to worker organisation and political struggles based on their common class interests. During my research period (2018–2022), two collective actions in China's technology industry caught my attention. First is the 'anti-996 campaign' in 2019, a wave of online protests in China's tech world (Financial Times, 2019). This activism sparked reactions from Beijing to Silicon Valley, where many workers at international software companies such as Microsoft showed sympathy and solidarity with Chinese technology workers. Second is the 'Worker Lives Matter' campaign in 2021, during which employees in various industries, primarily technology and finance, shared their actual working hours online to an open-edit server on Github (Bloomberg, 2021). The two incidents pose some new sociological questions for students of technology workers in China: has any new strategy of labour resistance emerged in the workplace? If so, how is that possible?

Although China is one of the most repressive labour regimes in the world today (see Chapter 5), these two examples show that workers, including those in the tech industry, should not be seen merely as passively obedient to managerial control. In fact, past studies of factory workers in China have shed much light on the organisation and resistance strategy of workers (Chan and Hui, 2012; Gray and Jang, 2014; Schmalz et al., 2017; Pun, 2021). The study of labour activism in modern China begins with the analysis of state worker demands

for pension benefits during the privatisation and marketisation of state-owned enterprises (SOEs) in the 1980s (e.g., Hurst and O'Brien, 2002; Hurst, 2009). As China's economy continued to open up, the country's labour-intensive industrialisation strategy subjected millions of rural migrant workers to 'one of the most exploitative labour regimes in modern history' (Chan, 2001). Researchers and journalists have documented egregious labour violations, along with subsequent labour disputes and activism responding to these workplace malpractices (see China Labour Bulletin, 2020). To name a few, these include strikes at a Honda auto factory in May 2010 (Chan and Hui, 2012), against the shoemaker Yue Yuen in 2015 (Schmalz et al., 2017), at Foxconn factories (Pun and Chan, 2012), and the struggle against Jasic, in Shenzhen, in 2019 (Pun, 2021). While these collective actions were motivated by various demands and implemented through a variety of strategies, a common thread is that they were almost entirely independent of the labour officialdom of the All-China Federation of Trade Unions (ACFTU).

Researchers have long been critical of the ACFTU's role in representing workers interests because, as Chen Feng (2009: 663) explains, the ACFTU is "subservient to the state" and "*de facto* government organs". Such bureaucracy limits the autonomy of the Federation within the framework defined by the government and prevents it from becoming a voluntary organisation that represents social power rising bottom-up from society (Chen, 2009: 663–664). In a similar vein, Bill Taylor and Li Qi (2007:703) critically conclude that "the ACFTU is largely ineffectual in carrying out trade union functions, lacking the willingness or ability to protect workers' interests." It is also noteworthy that all forms of strike or walkout from work are illegal in China, as the right to strike was removed from China's Constitution in 1982 (China Labour Bulletin, 2020). Therefore, in general, Chinese workers lack any "associational" and "institutional power" in the labour market (Wright, 2000). Lee (2007: 24) paints with an even more pessimistic brush, arguing that "given the large labor supply, the prevalence of unskilled and low waged jobs, and the non-existence of independent unions, Chinese workers can hardly be described as having marketplace, workplace, or associational bargaining power."

Nevertheless, to Dorothy Solinger (2007: 432), the absence of absence of active, assertive unions in China leads Chinese workers to look more aggressively for opportunities to demonstrate on their own. Without associational, institutional or structural power, Chinese workers have developed their own sets of strategies to defend their interests through societal

power, for example by collaborating with civil society (i.e., labour NGOs). Jenny Chan (2021) demonstrates that labour NGOs perform typically labour union institutional functions, providing social and cultural services, legal consultation, leadership training, and gender rights awareness workshops to male and female workers in major industrial districts. In addition, some labour NGOs have experimented with partnerships with multinational corporations, coordinating corporate social responsibility programs to improve work conditions. In some rare events, NGO activists directly participated in and even led labour strikes and protests (e.g., Franceschini and Lin, 2019), but their actions since 2013 have been forcefully quashed by the state (Fuch, Tse and Feng, 2019).

Against all these unfavourable conditions, Chinese workers have managed to retain their agency to initiate resistance using a bottom-up approach. Chen (2016: 25) summarises three notable characteristics of Chinese labour activism over his decades of research on the topic: spontaneous actions are usually initiated by individual activists who often are directly involved in the dispute; and workers' claims are enterprise-specific, non-cumulative and non-sustained in nature, all of which means that no organisation exists after the activist event and the actions themselves are short-lived. In practice, some workers – "rightful resisters" in Wendell O'Brien's (1996) lexicon – engage in legally allowed yet disruptive collective actions to voice their discontent, but these do not challenge the legitimacy of the governing authority or wider political-economic system. Others deploy both legal and more aggressive "extra-legal" means, such as blocking traffic and going on strike during their fight for improved workplace welfare (see Chan and Hui, 2022). In general, Elaine Hui (2022) argues, demands by Chinese workers can be divided into two types: prior to 2010, workers organised to pursue immediate economic interests; since then, they also have fought for the formation of enterprise unions that might provide them with associational and even institutional power. Further, she adds, workers and their associates have moved from merely defending their contractual rights to demanding welfare and dignity at work that is above the legally mandated standard.

In reality, Chinese workers remain trapped in a disadvantageous position in the industrial relations dynamic, and their demands can only be achieved through government mediation and arbitration. This phenomenon diverges from experiences in the West, where employers (including employer associations) have gradually developed a non-conflictual

arrangement with workers that generally does not involve state invention (Hyman, 2008). In the "996" case, the Chinese government appears to be pursuing its interests through a policy of *non*-intervention. In her study of labour governance in China over the decades, Cynthia Estlund (2017) notices that local government officials in most cases would prefer to prioritise economic development over workers' demands in labour issues, because economic performance is the top reference for officials to be accessed by the central government. This thesis argues that this is also the case for the tech industry, as the government benefits tremendously (not least in the form of enormous taxation) from achieving "China's technology dream" and believes that "996" is necessary for this achievement (see Chapter 2). Therefore, it could be argued that it is against the state's interest to limit working hours in the industry and, consequentially, this "996" schedule remains common in China's tech industry today.

With an increasing awareness of labour rights, in 2019, Chinese technology workers lit up the first collective actions in the industry. Workplace policy in the tech industry, one of China's key economic pillars, has been loosely regulated. For instance, while a Chinese court found that the '996 practice' – 9am to 9pm, six days per week – violates the *China Labor Law*, no follow-up government action has yet restrained this inhumane management practice, which continues to be common in the tech sector. In March 2019, technology workers initiated an 'anti-996 movement' by publicising their working hours and related information on *Github.com*.

Kevin Lin (2020) argues that anti-996 resistance is an example of networked organising that shares familiar features with previous labour activism in China, such as a 2016 strike by Walmart store workers. In networked activism, workers organise from more than one workplace; each location serves as part of a mutually supporting network through which information is shared, strategy and actions are discussed, and, most importantly, distant individuals develop feelings of solidarity. These collective efforts by Chinese technology workers drew much attention from the press and created enormous public pressure on employers to respond to their demands. Scholars who investigate labour organisation through digital networks (e.g., Hau and Savage, 2022) refer to this phenomenon as "social media unionism", arguing that social media can improve unions' engagement with

audiences and enable new forms of connection between unions and other social groups, with the possibility of leading to union revitalisation.

Considering the process of organising workers, social media platforms also play an essential part in the '807 activism' (see Chapter 5). However, instead of analysing media content and communication strategies, this thesis investigates the wider connection and empowerment between civil society and this labour-activist moment. This case study shows that, in comparison with the anti-996 movement, activists are more mature in negotiating directly with their employers (through actions such as petitions). At the same time, they depoliticise the event by not protesting against the state. This makes the activism an excellent case study of the characteristics and constraints of the social movement unionism theory in the context of contemporary China. Social movement unionism is a concept developed in the 1980s to explain the perceived changes in labour movements in some newly industrial countries such as Brazil, the Philippines, and South Korea. In recent years, some researchers adopted this term to describe and theorise on the efforts of progressive unions that go beyond traditional business unionism in the US. The core idea of social movement unionism is to highlight the importance of collaboration between labour and other social movements in striving for social (and workplace) changes. This theorical debate will be reviewed in more detail in Chapter 4, where it will be shown that the case illuminates how the recent feminist movements in China have empowered labour activism in the country, albeit in a limited way.

Lastly, the strategies used in the two campaigns mentioned above are completely different from any previous labour activism: they took place primarily in the digital space and did not involve work stoppage. To what extent social movement unionism theory is applicable to understand this activism, and what the limitations are in reality? Also, can digital activism challenge the dominance of managerial control and the capital they represent in the workplace? To answer these questions, academics must first understand the work experience of Chinese technology workers. The implications of the findings presented in this thesis are relevant to digital-economy-related labour movements around the world, particularly in non-democratic contexts.

One might argue that in China, unlike Western countries, the lack of independent trade unions and democratic participation in the workplace could make worker organisation

more difficult. But organising technology workers activism in countries with a long union tradition, such as the United Kingdom, has also faced significant challenges (see, for example, Ruffino and Woodcock, 2021). One could also argue that the lack of physical activism in the Chinese tech sector is due to the high repressiveness of China's government toward labour activism. However, neighbouring countries such as South Korea experienced a significant labour movement during the military regime in the 1980s, and this movement eventually became a powerful force for democratisation of the country. Although historical and social factors may impinge on the formation of workers' consciousness and militancy, and many other analytical angles could apply to this topic, including politics and organisation studies, this study presents a rigorous sociological analysis to reveal how these forces do or do not function in reality. Past industrial relations studies remind us that all labour activism, big or small, official or wildcat, has included underground networks and hidden logics that await researcher exploration and explanation (Hyman, 1989). These are the questions that motivated this doctoral thesis. Through a qualitative and explorative research approach, the answers to these questions shall connect this study with the wider sociology of work and the political economy of China.

1.2 Research background

1.2.1 Work in the knowledge economy

With the rapid expansion of the digital economy in the 21st century, workers in the information technology (IT, or sometimes 'tech') sector have continued to become a subject of academic inquiries in the sociology of work and employment (Adams and Demaiter, 2008; Marks and Baldry, 2009; Dorschel, 2020; 2022; Lin, 2020; Li, 2022). A common understanding of technology workers, especially those in North America, is that they are a group of well-educated talents with a high technology proficiency, high social mobility, and often a bohemian lifestyle. American scholar Richard Florida (2012) refers to them as the 'creative class'. Regardless of its controversy, the idea of fostering a 'creative class' and competing for creative talents is now informing a popular policy discourse in today's globalised world economy. The latest example can be noticed in the UK Digital Strategy, published in October 2022, which proposes to introduce new High Potential Individual and Scale-up visas, 'so that UK digital businesses can easily recruit from anywhere in the world'

because it is ‘vital that the best and brightest from around the world can quickly and easily come to the UK’ (DCMS, 2022).

Academics, especially in the sociology of work and particularly those within the Marxist tradition, are highly sensitive about the idea of *class*. Debates concerning the decline of the working class and the subsequent rise of a new (middle) class of workers date back at least 40 years, when a real-world global turn was described as a ‘new historical epoch’ in which the world began marching towards a ‘post-industrial’ ‘knowledge economy’ in the ‘information age’ (Bell, 1973; Rifkin, 1995; Castells, 1997).

In *The Coming of Post-Industrial Society* (1974), Daniel Bell argues that unlike previous societies that were based on agricultural and industrial modes of production, the ‘post-industrial society’ is driven by a new class of knowledge and technology workers and is organised around scientific and technological revolutions, leading to the growth of the service sector and white-collar information jobs. In post-industrial society, Bell argues, neither class nor status prevents people from becoming professionals; the onus is entirely on the individual and what they want to be. Projecting from the then-recent United States experience, Bell predicts that post-industrial society blue-collar jobs – those directly related to manufacturing – will shrink as a result of automation and increased productivity. This would substantially increase the influence of marketing and various professional occupations connected with services and information sectors.

An even more positive narrative is made by Thomas Friedman (2005), who argues that a new digital labour force enjoys greater freedom, more bargaining power and increasingly flexible work schedules. The new age, powered by the personal computer, fibre-optic cables and workflow management, has created permeable nation-state boundaries where the smooth flow of technology and capital encourages individuals, regardless of nationality, to develop skills with global applications. According to Friedman, this is ‘Globalization 3.0,’ which ‘makes it possible for so many people to plug and play, and you are going to see every color of the human rainbow take part’ (Ibid.: 11).

Together with other influential writings and empirical research, a foundational assumption in the intellectual community is that the production and processing of

information, is fundamentally different from factory-centric manufacturing in the industrial era. The shift from manufacturing to knowledge work in the global economy has led to an expansion of 'white-collar' employment that does not easily fit into either end of the dichotomic Marxist class system. As Pablo Castells (2000) argues, information technology has created new historical conditions, and productivity is generated through and competition is played out in a global network of interaction between business networks. Through outsourcing, subcontracting and mechanising, he posits that information technology enables the restructuring of the labour-capital relationship within the work process. Therefore, the line between owner, manager and producer is becoming increasingly blurred and, consequentially, *individual experiences* are replacing collectiveness consciousness in the workplace.

Friedman, Bell and Castells share the expectation that digital technology will propel social changes which will correlate strongly with technological innovation, horizontal organisational structures and an improved standard of living in a 'network society'. As a result,

> the work process is increasingly individualized, labor is disaggregated in its performance, and reintegrated in its outcome through a multiplicity of interconnected tasks in different sites, ushering in a new division of labor based on the attributes/capacities of each worker rather than on the organization of the task, experience, power, and culture. (Castells, 2000: 502)

The celebratory view of these writers envisions that digital technology can bring a radical transformation of the capitalist order: a combination of new economy and technology creates an empowered workforce. They presume that this increased and deepened skill set provides more opportunities to secure gainful and meaningful employment, which in turn is tied to advancement and recognition. While these accounts add a great deal to the understanding of work and employment in the knowledge economy, academics must acknowledge that digital transformation at work is not a homogeneous and unified process; it is highly heterogeneous and fragmented, thereby creating new kinds of difference and inequality that await scholarly attention. This thesis argues that the impact of the implementation of technology on work does *not* have deterministic outcomes. Rather, outcomes could be highly varied due to

different social and political contexts. One convincing example of this "social construction" argument is provided by Stephen Barley's (1986; see also Barley, 2020) in-depth ethnographic study on the use of CT scanners in two radiology departments has revealed how the same technology, with the same role of workers, can lead to totally different work practices. Therefore, researchers should pay particular attention to the relationship between technology and human workers, and be cautious about predictions or conclusions that emerge from decontextualised calculations.

In China, just as new employment opportunities open up in the technology industry, so too do new forms of surveillance and control, new reward and disciplinary systems, and gender-based discrimination. In this vein, it is noteworthy that there is a series of relevant studies dating back to the 1980s. Insights from the earliest, focused on manual work, were then applied to knowledge work such as call centre operators to investigate labour control and surveillance, and the relationships between productivity and the implementation of information technology at work. By applying the Foucauldian concept of surveillance (Foucault, 1977) to the power/knowledge relationships in control practices, Sewell and Wilkinson (1992) argue that the information management system in institutions such as prisons is similar to power and quality control relationships in factories. As Anthony Giddens writes (1985:183–184),

> the disciplinary power as described by Foucault depends perhaps primarily upon surveillance in the sense of information keeping, especially in the form of personal life-histories held by administrative authorities. But it also involves surveillance in the sense of direct supervision. In this sense, prisons and asylums share some generalisable characteristics of modern organisation, including the capitalistic workplace.

Graham Sewell and Barry Wilkinson (1992) argue that the 'just-in-time' mode of production both creates and demands surveillance systems that aim to improve production efficiency through control over labour processes. Unlike scientific management (Taylor, 1911), which relies on and is limited by the physical architecture of machinery and the factory, they persuasively demonstrate that information technology can carry out surveillance that is no longer limited by physical space, what they refer to as the 'Electronic Panopticon'

(Sewell and Wilkinson, 1992: 283). Therefore, management can achieve benefits from the delegation of responsibility to workers while retaining authority and disciplinary control through their ownership of the information system.

Later, Phil Taylor and Peter Bain (1999) examined Foucault's concept of surveillance in a knowledge work setting, arguing that information technology intensified the work of call centre operators. Modern call centres were established though the integration of telephones and computers, and facilitated by the development of automated call-distributor software, which took away control from call centre workers (see also Woodcock, 2017). They notice that management software in the call centre exercises extensive monitoring that is beyond human supervision, and employee performance data is captured by technologically driven measurements which are then subjected to human interpretation. Such forms of surveillance, they argue, is an evidence of the Taylorisation of white-collar work in society, which creates what they call 'an assembly line in the head' (1999: 109). On the other hand, such extensive surveillance also creates managerial problems, including demotivation and a high turnover rate, eventually damaging the quality of service delivered by the operators. Similar findings are reported in many other studies of call centres (Bain et al., 2002; Kolinko, 2002; Mulholland, 2002), which provide 'an important early example of [knowledge] work that could be digitally legible' and 'allows it to be measured through discrete data points' (Woodcock, 2022).

In the meantime, some writers criticise the application of Foucauldian surveillance to the labour process. This is mainly because the dynamic process of capital accumulation and the contested nature of power, authority and control in the workplace is contextually specific: these variables operate differently in, say, mental institutions than in economically productive workplaces. That is, there is a voluntary element of employment, and worker discretion is essential to the creation of surplus value, especially in the knowledge economy. For instance, Paul Edwards and Andy Hodder (2022) argue that managers often seek not only control but also consent in labour discipline (e.g., through agreed procedures), because this is beneficial to both parties: workers are not subjected to arbitrary punishments, and managers receive fewer complaints. Through this lens, some empirical questions are awaiting exploration: How has the management technology that has evolved over the past two decades succeeded in extracting extra surplus value from technology workers? To what extent does the

management software deployed in China's tech industry mirror the 'Talyorisation' of call centres 20 years ago, and in what ways are the two work/surveillance environments different?

1.2.2 A sociological lens: Researching work in China's digital economy

This study adopts a sociological lens to investigate Chinese technology workers and their activism in contemporary China. Returning to Karl Marx (1967[1867]), the exploitation in capitalist production leads to workers' economic struggle within their workplaces for improved working conditions and wages, and the consciousness formed from these experiences gives rise to broader forms of organisation and political struggle. Therefore, Marxist researchers in labour studies insist that class identity is important for at least two reasons: (1) class is a result of capitalist production and, as such, it is fundamental to understand the wider political economy in society; and (2) class identity is a source of power in collective action.

As labour studies scholarship developed, commentators began to criticise the concept of class identity. For instance, E.P. Thompson critiques the positivist tendency of treating class 'as a thing,' a fixed sociological category that determines consciousness. His theoretical trajectory leads to the understanding that 'consciousness of class arises in the same way in different times and places, but never in just the same way' (Thompson, 2013[1963]: 9). Against this reading of class consciousness, he proposes to treat class as a 'historical phenomenon,' not 'as a 'structure,' nor even as a 'category,' but as something which in fact happens (and can be shown to have happened) in human relationships' (Thompson, 2013[1963]: 8).

Besides the commonality of lived *experience* as a way of defining class, a rich set of studies in the last two decades has analysed class based on the *structure* of economic exploitation in capitalism. From a Marxist perspective, exploitation is inherent in capitalist production relations. The objective of an employer (the capitalist) is to earn profit, while that of the worker is to earn wages. Erik Olin Wright, a principal proponent of this perspective, argues that the exploitation-centred approach measures and analyses the material interests that structure exploitation. One way of defining this exploitation is through the quantitative

measurement of phenomena such as the wage-profit gap, skewed allocation of resources in favour of the rich, and private property.

While Thompson discusses workers experiencing this oppression only through the everyday grind to survive in conflict-ridden social relations, Wright (1989: 207) suggests that an account of both interests and experiences is essential for structural analysis. Over the years, the definition of capitalism as a surplus value-extraction system has not changed, but the system itself has developed into a more complex technological (and organisational) structure in the digital economy. As a result, class formation in workplaces often cannot simply be crystallised into two distinct sets of interests and classes: bourgeoisie and proletariat. Rather, different real-world interests of the working class overlap and create complexities and conflicts. Wright argues that, to accommodate such complexities of capitalism in understanding exploitation, the two-class model at the heart of Marxist theory is insufficient, especially in light of the rise of middle-class professionals and experts (Wright 1989, 348). Both Thompson and Wright successfully inform a better understanding of the vulnerable workforce in the digital economy by considering the material interests as well as lived experiences generated by the new digital-mediated 'workplace relations and practices', in turn reconstituting the concept of class (Wright, 1989: 207).

These debates of the class concept are important for this doctoral research project because they lay the theoretical ground for studying labour in China in this century. Workers' subjectivity and their work experience become the core of academic inquiry, which contributes significantly to our understanding of how work is controlled and experienced by Chinese labourers under marketisation and globalisation. The situation of rural migrant workers in factories is a popular and important research topic that can inform interpretations of the social-economic transformation that China has been undergoing. It also is an example of how work and labour are connected and relocated in the 'networked', 'globalised' society.

For instance, in *Made in China: Women Factory Workers in a Global Workplace,* Pun Ngai (2005) argues that in China, there is 'a new generation of migrant workers has rapidly developed a range of examples of class awareness and understanding in the workplace'; Later, Chan and Pun (2009) describe how, in addition working together, factory-provided dormitories provided another common basis for making an increasingly conscious

‘new working class’ that can participate in interest-based or class-orientated labour protest. Class identity, these writers emphasise, can provide a strong connection between the relations of production and the workers’ subjective experience and enhance the explanatory power of arguments about workers’ collective actions in a wide range of contexts (Chan, 2012).

However, some researchers argue that the Marxist idea of class formation in capitalist society is an adequate theory for explaining labour activism in China. For example, in *Against the Law: Labor Protest in China’s Rustbelt and Sunbelt*, Lee Ching Kwan (2007) distinguishes between worker protests in China’s ‘rust belt’ (the deteriorating state sector) and its the ‘sunbelt’ (the developing private sector): While she believes the former are ‘protests of desperation’, caused by the loss of their privileged social position and work-related welfare during marketisation, the latter are ‘protests against [institutional] discrimination’, because the *hukou* system bars them from receiving employee benefits promised by China’s labour laws. Therefore, the worker activisms she studied are ‘livelihood struggles’ rather than ‘class struggles’; indeed, the marketisation of China’s economy is unmaking (pre-state-owned) factory workers’ class identity rather than making, which is contradictory to what Marxist economic determinist predicted. Sceptics also questioned whether class consciousness actually exists in these migrant workers. Chen (2005), for example, argues that although Maoist texts were repeatedly and frequently used by workers during protests, this usage should be seen as a sign of nostalgia rather than class consciousness; from a similar perspective, William Hurst (2009) argues that the importance of Mao-era ‘nostalgia’ can be a critical catalyst for labour activism, and traces the history of ‘backward-looking frames’ as central elements in labour protests in China.

In recent years, as China’s government has promoted the transition from manufacturing into the digital economy, researchers have brought these debates into the new economic domain. This includes studies investigating platform workers in China, including drivers, delivery workers and food delivery riders. These researchers, however, have never let migrant workers out of their eyesight. Most rural migrant workers remain low-educated, with limited skills and limited social protection, and suffer the most in China’s urban labour market. Moreover, the growth of China’s digital economy has spread labour activism, such as the two activisms mentioned in the previous section, from physical into online space and from marginalised rural migrant workers to well-educated knowledge workers. This doctoral

research project is positioned on this watershed, and provides an early, in-depth analysis of how the development of digital economy impacts on people's work experience and China's wider industrial relations structure.

In addition to inspiration from the labour studies mentioned above, this doctoral research focuses on the less-researched Chinese technology workers, bringing them back into digital labour scholarship. It is argued that in the digital economy, a lot of attention is paid to the market actors in the digital economy, such as consumers and their free labour (e.g., Terranova, 2000), but technology workers are often excluded from the discussions (Dorschel, 2022). Meanwhile, the importance of actors such as the state is significantly downplayed in academic discussions, which poses a crisis for industrial relations studies that emerge from the tripartite, pluralist tradition. As a stream in the sociology of work with a long intellectual tradition, industrial relations were formed in the era of industrial, Fordist production to study work and employment or, as some writers see it, labour problems, because labour dissatisfactions in industrial society often lead to social unrest at the end.

It is understood that back in the industrial days, state interventions played a decisive role in the structure of the labour market, characteristics of the production system, organisation of labour, dynamic of collective bargaining and functioning of the industrial relations system as a whole (Dunlop, 1958). However, today's digital economy is characterised by flexible modes of production in the "information society". The state has chosen to deregulate this labour market, paving the path for 'management via the market' in order to foster a 'new spirit of capitalism' (Boltanski and Chiapello, 2018) and promote an 'entrepreneurial self' (Skeggs, 2004). Furthermore, workers are increasingly replaced by automation in the digital economy, and those who remain are constrained to adjust to project-based work and employment arrangements that enhance corporate flexibility. As a result, unions and collective "worker identity" (i.e., class) lose momentum in generating resistance movements. To many researchers, the tripartite model of industrial relations has collapsed, and debates rage about how industrial relations will unfold in the future (for example, see Perulli and Treu, 2019).

Against all of these academic discussions, China presents an odd case because it demonstrates both neoliberal and authoritarian characteristics in the globalised digital economy (Nonini, 2008). A recent reflection by Eleonore Kofman, Maggy Lee and Tommy

Tse (2021) calls for the British sociology of work to broaden the basis for the production of knowledge and to attract scholarship across a range of country contexts. In particular, they argue that China exemplifies many of the ongoing debates and highlights a number of important questions for the sociology of work and employment though it does not fit neatly into the traditional binary model of a North–South divide. The configurations of work and employment have been continuously (re)shaped by significant enterprise reforms and the changing state-employer-employee relationships.

What role does the Chinese government play in the development of the technology industry? Is a digital workforce emerging in China and, if so, how does it reflect China's political economy? If not due to a common class identity, what motivates workers to participate into collective actions? This doctoral research project was designed to contribute to these debates on the sociology of work with reference to China's technology workers today.

1.3 Theorising about the impact of technology on work

i. Marxist traditions

Karl Marx is one of the first scholars to theorise about production relations in industrial capitalism. Today, his labour process theory (LPT) has become a key conceptual apparatus for the analysis of working conditions and capital–labour relationships. 2022 marks the 40th anniversary of the International Labour Process Conference and, with over 300 presenters from all around the world, this theoretical approach clearly remains influential, if not dominant, in the scholarship of work and employment studies in this century.

According to Giddens (1982: 38), Marx's original approach to the LPT sought to demonstrate that 'the rationality of technique in the modern industrial enterprise is not neutral in respect of class domination'. It seeks to illuminate the appropriation of science and technology for industrial work, and to conceptualise the relations of technology in production. As Marx (1973[1858]) observes, workplace technology simplified the labour process and, in so doing, reduced the demand for workers, increased competition among them, and degraded the experience of work (what he called alienation).

Drawing on Marx's writings, Harry Braverman further develops labour process theory in his book *Labor and Monopoly Capital*, published in 1974. Braverman's labour process analysis looks at the appropriation of science and technology, which transform not only the nature of work but also how work is managed (under Taylorist principles). Therefore, Baverman's conceptualisation of technology in industrial capitalism and its impact on the labour process is prone to reveal the reduced agency of workers.

In addition, labour process analysis in these early writings was theorised as the knowledge of social relations in the workplace and the understanding of the links between industrial systems and the wider society. As Thompson (1989) argues, early industrial sociology regarded the factory as the *recipient* of external orientations to work, instead of a source of conflict and identity, and so the conflicts at work were understood to be associated with orientations toward work (such as class conflicts between the proletariat and the bourgeoisie) rather than work itself. Therefore, Marxism advocated socialist reform in society as the most effective means to address these labour-related problems.

In this vein, Marxist LPT writers consider technology to be a mechanism and system of control in the factory, and they documented technical control in many forms: using technology to replace labour, to separate workers and knowledge, to deskill labour, and to monitor worker performance, to name a few (see e.g., Edwards, 1979). Braverman's work, in line with other British industrial sociologists at that time, emphasises the dynamics of control, consent and sometimes resistance at the level of production in industrial capitalism (Thompson and Smith, 2010). Labour process analysis has been applied in various industrial contexts to unpack the relationships between the employer, who owns the means of production, and the worker as the possessor of labour power, and how these relationships set in motion the 'labour process', conceived of as the process of transformation of labour power into a commodity according to set relations of production (Burawoy, 1979).

Despite its high impact, Braverman's writing is not without criticism. For instance, the labour process debates in recent years were criticised for 'a tendency for a very narrow set of interests to emerge which has not always helped define or develop a broader sociology of work' (Strangleman, 2005:7). Wilkinson (1985) stresses the political interests of capital, as

well as sectoral dynamics that have shaped decisions to invest in the design, choice and implementation of technology. Based on multiple case studies, Wilkinson's analysis highlights the junctures in the subsequent stages of choice and deployment of technology in organisations: unions, and workers, sometimes guided by social policy, can play a role in how technology is utilised and affects the labour process. This work emphasises that the implementation of technologies in the workplace should not be understood as a simple, unidimensional decision by the management.

ii. Moving beyond Marxist traditions

As a response to (and critique of) the Marxist LPT literature, especially Braverman's deskilling thesis, a range of studies undertaken in various industrial contexts have assessed how the implementation of workplace technology affects different aspects of work (such as control and skills), the unequal distribution of power, and the expansion of industrial capitalism. The analytical lenses of many of these studies are similar to Braverman's, but they also extend the scope of study to job control in a variety of workplaces, to worker resistance, and to issues associated with gender in the labour process.

In this vein, one distinctive feature of these theory-driven case studies (often referred to as 'post-Braverman writing' or 'second-wave LPT writing') is their recognition that workers have more autonomy in the workplace than Marx imagined (Edwards, 1990; Hall, 2010). Whilst these writers believe that labour power is reproduced from both inside and outside the workplace, *relative autonomy* means that indeterminacy remains in how structural, organisational, historical, and other external factors affect labour process outcomes. Consequentially, their arguments are disentangled from the technological determinism of Marxist traditions and, at the same time, they contain a shift in analytical focus to a materialistic account of conflicts when studying work and control, instead of the social relations only.

During the 1990s and into the 2000s, Paul Thompson and others extracted a number of key elements from the LPT and formulated the 'core theory' (e.g. Thompson, 1990; Thompson and Smith, 2001), which emphasises the need to describe how the transformation of the processes of labour power unfolds in a variety of specific workplaces, as well as the

need to understand disparate labour processes in advanced capitalism (Jaros, 2010). Their writings have further pushed labour process analysis towards workplace-specific concerns with work relations and political economy.

The core theory holds that capitalist labour processes have three characteristics: capital's need to *control* labour; a logic of *accumulation* that impels refinements in technology and administration; and a fundamental, *structured antagonism* between capital and labour. Because it is the place where labour is 'valorised', the point of production (i.e., the labour process) is privileged for analysis. Although the core theory draws heavily on Marx, it deliberately rejects the idea that there is an automatic extension from struggles within the workplace to broader struggles pertaining to social transformation, and therefore received substantial criticism from Marxian writers (see Jaros, 2005). While Thompson (1990) agrees that labour processes have some connections to the broader political economy, he insists that, because of the 'relative autonomy' of workers, labour processes at the point of production are not determined by those connections; instead, they are significantly influenced workplace-specific contextual factors.

iii. Researching the politics of technology at work: a pluralist industrial relations approach

In recent years, researchers have lamented that theory-led case studies premised on various kinds of technological determinism provide an insufficient understanding of the political aspects of the implementation of technology in the workplace. These scholars insist that critical reflection on theory is needed before frameworks with greater explanatory power can be crafted. Richard Hall (2010: 159) argues that the LPT 'lost[loses] its way and retreated to offering empirically rich but theoretically modest studies of technology at specific worksites and particular industrial settings.' Hall proposes that researchers pay more attention to the *political* dimension of technology, including the political interests behind the implementation of new technology in the workplace to strengthen control over the labour process. In a similar vein, in their latest reflection on the LPT literature, Thompson and Lasser (2021) argue that while the second-wave studies provide invaluable insights into the concrete utilisation of different technologies at work and their consequence for workers, they

suffer from a workplace-centric focus and limited theoretical engagement with the political economy of technology.

This doctoral research project seeks to fill this theoretical deficiency by adopting a currently under-utilised theoretical framework in the sociology of work: the pluralist industrial relations (IR) approach, which could be an important complement to the predominant labour process analysis. The concept of industrial relations was born as a theoretical alternative to radical Marxist frameworks, in response to inadequacies in the latters' analyses of labour and social problems associated with the rise of industrial capitalism in the late 19th century. Like Marxists, industrial relations writers recognise that employers and employees in an employment relationship have competing interests (i.e., the plurality of interests), and are critical of the callous and exploitative treatment of labour. For sure, these two dominant traditions share some overlapping interests and have made adaptations and widened their scope of research over the years; for instance, Alan Fox (1966) advocates for integrating industrial sociology into industrial relations responding to the popularity of labour activism in that period. However, there are two fundamental differences between the two intellectual traditions. First, the Marxist perspective expects that new technology will serve the interests of capital, which, in turn, will further devalue workers (see Hughes and Southern, 2019); by contrast, pluralist IR understands the implementation of new technologies to be the result of negotiations between worker and employer that can benefit both parties, even though the benefits might not be distributed equality in the workplace. Second, unlike Marxists, pluralist IR scholars do not reject the capitalist system and dismiss the needs of the employer (Kaufman, 2004). Instead, they underscore the importance of balancing the legitimate interests of both parties and often advocate for the involvement of non-market institutions such as governments (Budd, 2012), whose regulatory authority can resolve disputes between employers and workers in ways that are sensitive to the interests of both groups, as well as those of society as a whole.

The labour problem, from the pluralist IR point of view, is the result of imbalances in the industrial relations system (Budd, 2006), such as uncontrolled management power within a company (often with the deployment of technology) and unequal bargaining power in the labour market. These empirical realities guide the research questions (see section 1.4 below) of the current project, which seeks to understand the political influence of the internet

business in China; the management approach that exists in the internet industry; how bargaining power is distributed; and ways through which workers can empower themselves in the negotiation of work.

This thesis argues that the pluralist IR approach is a suitable theoretical framework to investigate China's internet industry for the following three reasons:

Firstly, pluralist IR helps academics to advance our understanding of working conditions and work experiences in China's internet industry and reveal the business reality. As argued by Taylor, Chang and Li (2003, pp. 2–3), in early industrial relations analysis, the primary focus was on the (economic) relationship between employers and workers in a factory setting, in which 'there is a separation of the owners of production and workers who engage in some form of productive activity in exchange for wages.' As scholarship developed over the decades, under the influence by other academic disciplines (e.g., sociology, law, and later human resource management), pluralist IR today has become a multidisciplinary and often interdisciplinary academic field: it does not merely concern with the market price for labour in its pure economic sense, but also the relations that determine the price of labour, the including the political aspects of work and employment. Heery (2016: 7) argues that rather than researching the problems *of* labour, nowadays IR researchers are more focusing on the problems *for* labour, which are viewed as the products of disorderly markets. These include low pay, poverty, work intensification, work-life balance and precarious work.

As China's internet industry is becoming more influential to the national and global economy and people's life, more academic attention should be devoted to investigating this subject critically. However, as Sun Ping and Michelangelo Magasic (2016) point out, China's technology (and internet) workers have thus far not been the object of much academic research, despite their widely acknowledged contribution to the country's rapid economic expansion. This may be due to the secretive nature of these companies and their requirement that all employees treat work-related matters confidentially. This preference may have intensified after the '996' controversy, during which an information campaign led the general public and even the Chinese government to criticise the industry standard of 12-hour days, six days per week (see VICE Asia, 2021). Other factors include the Chinese government's

ban on genuinely independent unionism and labour-related non-government organisations engaging with workers in the internet industry (Fuchs, Tse and Feng, 2019). The overall result has been that labour issues in China, including the working conditions in the internet industry, are rarely discussed publicly, either online or through traditional media outlets and platforms. The pluralist IR research is an excellent theoretical apparatus to fill these knowledge deficiencies, because working conditions have always been on the top of the research agenda to IR researchers.

A second key theme in pluralist IR is the conviction that workers are capable of expressing themselves. This starting point has led to substantial research on trade unionism and how unions can provide representation and collective bargaining. While this power-associated analysis has become less relevant in the West, where strikes are far less frequent than they had been a couple of decades ago, the research framework is well designed for the analysis of developing countries such as China. China Labour Bulletin (n.d.) recorded over 14,000 industrial actions over the last five years, and the internet industry has joined the front lines of activism. This includes the anti–996 movement in 2017, the open share-drive in 2020, and the '807' online petition in 2021 (see Chapter 4 for workers' activism in China's internet industry).

The pluralist IR approach shines much-needed light on this wave of labour activism, providing insight not only into China's internet business environment, but also into the socio-political context where such activism took place and elements of that context that empower technology workers in their formal and informal negotiation of their workplaces. Perhaps most importantly, unlike (radical) Marxism, pluralist IR does not advocate for revolution, which poses a relatively small political threat in the eyes of the Chinese government. Even so, government officials have erected many barriers to IR researcher in China (see Chapter 7). In recent years, the Chinese government has increased its level of repression of labour research and activism, including activities that are motivated by Marxism and socialism. The pluralist IR approach acknowledges that workers stand in a position of structural disadvantage in relation to their employers, but understanding and resolving conflicts of interests and imbalances of power serves the interests of employers as much as workers, because resulting 'productivity coalitions' facilitate continued business growth (Heery, 2016: 5). In this sense, the current research project should be of positive interest to the Chinese

government, which see the internet industry as an important engine that drives national economic growth.

Thirdly, the pluralist IR research agenda prioritises the assessment of regulatory institutions and has a strong policy orientation. Pluralist IR involves the study of work–employment relations in all forms, and the approach is particularly useful for understanding work in developing economies. This of course involves the management of employees, but the outcomes of negotiations embedded in this management are shaped by forces beyond the workplace: the policies and politics of a state, the international division of production, the model of capital market, and the linkages between paid work and other socio-cultural aspects of workers' life experience. Industrial relations scholars do not subscribe to theories premised on technological determinism, and remain open but critical as they seek to understand the role that government plays in its implementation in the workplace. The critical perspective of pluralist IR analysis has become more crucial than ever, not only for providing an adequate understanding of the changing world of work in developing countries, but also for making sense of the wider political-economic and social issues in these locations. Understanding the political aspect of work can help fill the theoretical deficiencies of labour process analysis and provide an intellectual and empirical ground for advocating much-needed labour rights and workplace justice in countries with weak labour protections.

Finally, it should also be noted that the industrial relations approach is not without its critics. For instance, according to Robin Cohen (1991), traditions of industrial relations, trade union studies and labour history have provided an inadequate understanding of the labour questions in post-industrial society. Therefore, he advocates that a labour studies agenda should be based on the specific conditions in metropolitan, post-socialist and peripheral capitalism. Researchers following this path have broadened the horizon of labour politics and brought in the role of other social movements; consequentially a lot of research looks at the interaction between social movement and unionism in Asia, Africa and Central American countries (e.g., Lambert, 1990; von Holdt, 2002; Brickner, 2013). These studies highlight and extensively discuss the interaction between social movement and labour activism in society. This doctoral research project also draws and reflect on the social movement unionism theory, by investigating how the feminism movement in China influence collective action in the tech industry (Chapter 4).

At its heart, being a sociological study, this thesis is an exploration of the actual work experience in China's internet industry. This industrial category can be seen as a subcategory of the technology industry, which is populated by firms ranging from providers of internet hardware such as broadband networks to providers of internet services including entertainment, transport, e-finance, and online education. According to official statistics (China Statistical Yearbook, 2020), jobs in the internet industry come with a higher average salary than jobs in other professions in China. However, many scholars are concerned about the actual experience of work in the industry, and they often point out the unfair and exploitative nature of these jobs. For instance, Xia Bingqing (2018) suggests that the labour regime China's Internet industry remains exploitative today as the industry itself is an economic arena controlled by a few internet empires (i.e., Baidu, Alibaba and Tencent). Drawing on interviews with tech professionals, Xia concludes that workers (especially graduates) are subsumed into capital structures that focus on financing and acquisitions while disregarding and undervaluing human capital. To date, systemic pluralist IR analysis of China's internet industry has not yet been attempted, and understandings of the work experience in sizeable internet companies are particularly limited.

1.4 Research questions, aims and objectives

This doctoral research project aims to fill knowledge gaps associated with the following three research questions:

(1) How do China's technology workers perceive and experience the state's influence on industrial relations?
(2) What is the actual work experience in China's internet industry, and how is it being affected by the implementation of digital management technologies?
(3) How do technology workers experience collective action in China's internet industry, what motivates them, and what inhibits collective efforts?

This project intends to pursue these questions with the assistance of a theoretical framework founded in pluralist industrial relations. The primary objective of this project is to generate original understandings and insights related to the work experience of China's

technology workers, particularly with regard to how it is affected by government policies and the implementation of digital technologies in the workplace. This empirical account is useful for achieving the second objective, which is to provide a much-needed understanding of the industrial relations system in China's internet industry.

1.5 Research design and rationale

In formulating the research design, the goal was to select methods that can suitably address the research questions outlined above. After considering the costs and benefits of various approaches carefully, the value of a qualitative approach became apparent.

The aim of this research project is to understand the implications of job quality on the industrial relations system. This aim cannot be achieved without an in-depth understanding of workers' experience. Also, this research project is explorative in nature. Qualitative research methods can provide a higher degree of control over and reflexibility in the framing of questions, aims and methods (Brown, 2010: 230) and, therefore, enable researchers to adjust their strategies as the project develops. Some proponents of quantitative methods might argue that surveys performed repeatedly over time on the same or similar groups of respondent is the best way to investigate how job conditions vary as some conditions change. However, to the researcher's knowledge, there is no existing dataset regarding job quality in the internet industry, neither in China nor overseas. Also, surveys require a large sample size to produce a meaningful result. Given the limited time and resources in this doctoral research project, it would have been impossible to collect multinational data and analyse it single-handedly, not to mention that Digitech refused to grant permission for a survey of workers' perceptions of their job conditions. Indeed, no Chinese internet industry organisation has granted such permission for academic research since the '996' controversy in 2019 (Field Notes).

For these reasons, the current study was designed to explore the complexities that arise from the development and implementation of digital technology in the workplace in China's internet industry, in a way that can lead to an in-depth understanding of workplace issues. In this vein, qualitative methodologies such as in-depth interviews and ethnographic observation are favoured for the study of workers' experience. They enable the collection of subjective worker experiences and provide guidelines for thematic coding and further analysis of the collected information. These methodologies are in line with those deployed in

other studies of knowledge workers, such as Sean Nixon's (2003) investigation of the advertising workers in London, and David Hesmondhalgh and Sarah Baker's (2011) systematic research on media workers in the television, music and journalism industry in the UK. The in-depth, semi-structured interviews employed in these studies enabled the researchers to consider the accounts of interviewees about their work experiences, and to listen to some of their accounts of what happens to them, and why they think that things happen in the way that they do. This method sheds light upon data that would otherwise be easily overlooked, such as people's subjective experiences and attitudes (Peräkylä, 2005). This is also appropriate for the current research because it can capture the complexities of the informants' work experience as it reveals the wider structure of industrial relations in China's internet industry. An additional advantage is that, as Birch and Millar (2000) argue, interviews could be therapeutic, because they involve the emotional process of self-disclosure, and the interviewer employs the principles of empathic listening that are also used in counselling and therapy. Interviewing technology workers can provide them opportunities to reflect on their 'taken-for-granted' propositions connected with their employment relationship and lifestyle and to develop new understandings of themselves.

Moreover, the chosen methods effectively balance the analytical angle between 'intensive' and 'extensive'. That is, while this research looks extensively at the common properties and general patterns of a population (e.g., technology workers in this company), it also subjects questions related to how work is process to intensive analysis in a small number of closely observed cases, seeking to explain the production of certain objects, events and experiences (Sayer, 1992: 242–244). For example, extensive analysis reveals similarities in technology workers' choices about time allocation, while intensive analysis yields insights regarding what might bring about positive and/or negative work experiences in the internet industry.

However, there are some potential limitations of interviewing as a method. The interviewer can inadvertently ask leading questions, and interviewees can be affected in all sorts of ways by the interview situation. Michael Burawoy (1998: 12) argues that interview is a social context, embedded in other contexts, all of which lend meaning to and are independent of the question itself. These context effects include "interview effects", which 'create the problem of reactivity, in which interviewer characteristics (for example, age and gender) or the interview schedule itself (for example, order or form of questions)

significantly affect responses' (Burawoy, 1998: 12), for example. Therefore, in this study, interview findings are triangulate with data collected through ethnographic observation for validation and a great care has been taken to interpret the any contradictions noticed during the fieldwork.

In his own study of Zambian copper industry, influenced by the Manchester school of social anthropology and its "extended case method", Burawoy (1998: 5) suggests that ethnographic researchers should pay particular attention to the 'discrepancies between normative prescriptions and everyday practices'. Arguing from a reflexive science perspective, he believes ethnographic researchers should takes advantages of intervention into the field and maintains a 'embedded objectivity' (Burawoy, 1998: 28), and contribute to the continual improvement of existing theory rather than simply seeking generalisation. On the matter of intervention, the researcher acknowledges that his identity could also has an effect on how respondents react to the questions. Although the researcher can speak mandarin Chinese (i.e., Putonghua) fluently, his accent is noticeably different from those who were born and raised in mainland China. An unintended advantage such "foreignness" is that might have elicited more detailed responses, as participants 'recognised' the investigator as an "outsider" without prior knowledge about China's internet industry. In addition, this "foreignness" was sometimes useful as a conversation icebreaker, as new informants were curious about what had brought a foreigner to mainland China during the COVID–19 pandemic, given the fact that the People's Republic of China has the strictest travel policy in the world. This provided opportunities for the researcher to introduce himself and his research project naturally. On the other side, such recognition might have led to a more formal tone during a conversation, as difference sometimes leads to defensiveness. A few informants showed an interest in the research project and, maybe out of their empathy, seemed to be trying to give the interviewer the responses that they imagined that he expected. This suggests that the intersubjective nature of conducting interviews can have an profound impact on the reflexivity of respondents.

Another challenge to the interview method is revealed when a person is interviewed repeatedly, over time. Interviewees might change their views about complex issues over time, even from one day to the next, and especially so in complex and uncertain situations. This happened in this project when a number of interviewees reported that they have long working hours (the so-called '996 schedule'), but later several mentioned regular social activities with

their colleagues throughout a typical work week. Another example is when the possibility of collective action was discussed. While some interviewees initially showed no interest in labour activism, a few of them changed their attitude after the “807” movement, as is discussed in Chapter 4. Also, interviews are events in which people are asked to reflect in language on processes that they might take for granted. Indeed, there may well be aspects of practice and experience which people simply cannot explain verbally: unacknowledged conditions, unconscious motivations and unintended consequences. This challenge is particularly acute because some interviewees had undergone years of technical training in computer sciences; talking to these highly specialised computer experts (or “computer geeks”, to some people) required both patience and skills in communication.

The author adopted a number of strategies to address these potential pitfalls of the interview method. Firstly, he conducted pilot interviews with friends who work in the internet industry. Based on findings from these pilot studies, he revised the interview questions. For example, some academic terms were rephrased into layperson terms. Also, to enhance the quality of the data, the researcher situated himself in the same cultural world with the interviewees, to socialise with them to gain their trust. For example, he was a regular patron of the corporate café, and some interviews took place there. Most of the interviews were conducted during June–August 2020, when the researcher lived and conducted fieldwork in Hangzhou, the headquarters of the pseudonymous “Digitech” and “DigiBuy”. Before each interview, the researcher gained as much information as possible about the interviewee and the company. This background knowledge helped him to detect equivocations, evasions and unusual frankness. In addition, open-style questions were used, both to avoid leading questions and to elicit value-laden responses. The researcher cross-checked interviewee accounts against each other and against data collected during workplace observations, looking for consistencies and contradictions.

Although the demography of workers in the internet industry is relatively homogeneous in terms of age and gender (mostly young males), the researcher tried to diversify his sample by talking to workers from both junior and managerial levels, in order to understand how seniority affects the worker experience in this organisation. What is more, the researcher considered it essential to interview different types of workers in the organisation – from software engineers to graphic designers and from marketing executives to human resource specialists – because the internet industry contains a wide spectrum of

jobs and each job category might generate its own set of work experiences. The broad range of interviewees enriched the degree of representativeness in the study, and captured the widest possible range of experiences. Lastly, the researcher put extra effort into the recruitment of female workers as interviewees, in order to study whether or not gender has a role to play in shaping the work experience.

1.6 Researching the internet industry in China

Over the last decade, governments, companies, and other organisations around the world have poured significant sums of money into the development of digital technologies such as algorithms and artificial intelligence (AI), with increasing range and success across ever-more business sectors. For instance, according to a report produced by the Organisation for Economic Co-operation and Development (OECD), more than US$50 billion (£36.4 billion) has been invested in AI start-ups worldwide since 2011, and the amount of private equity invested doubled in a single year, 2016–2017 (OECD, 2018).

The People's Republic of China (hereafter referred to as China) is also a main player in the global technological race, and especially so when it comes to digital technologies. For instance, according to the Harvard Business Review (Li, Tong and Xiao, 2021), China is the world leader, surpassing even the USA, in producing research papers and filing patents in the field of artificial intelligence. However, despite its rapid development over the last few years, the actual impacts of these digital technologies are awaiting academic treatment, and understanding how digital technologies are implemented in the workplace is particularly lacking. While the platform economy and gig workers in China have received much scholarly attention (e.g., Liu, 2019; Sun, 2019; Wu et. al, 2019; Wang and Cooke, 2021), the impacts of digital technologies on conventionally employed workers have been largely unexplored. To fill this research gap, this doctoral research project seeks to provide an in-depth understanding of how digital technologies affect the work conditions of China's technology workers.

The company under investigation (i.e., Digitech / DigiBuy) is one of the top ten Chinese internet enterprises, specialising in e-commerce, operation systems, and internet-based technology. It is one of the world's largest e-commerce companies, and one of the largest investors in online communication and AI, including technologies that involve the handling of an enormous volume of transactions, online payments, warehousing, and

logistics. This work is supported by over 10,000 employees and well-established software systems.

Digitech is also a strategic partner of the Chinese government, which has invested heavily in AI-related research and development. The company has established laboratories and research centres in various locations in China, Silicon Valley, Singapore and Hong Kong, and constantly recruits talent from overseas. Today, Digitech provides the infrastructure and coordinates the R&D of artificial intelligence in government technology projects, smart city developments, cloud computing, and advertising. All of these characteristics make Digitech a unique and important case study for anyone who wishes to understand China's internet industry.

Before beginning fieldwork in China, ethical approval was obtained from the Department of Sociology, University of Cambridge, which confirmed that the research design to be implemented in the field would neither harm nor deceive the participants, and that it complies with the highest standards of academic integrity. A risk assessment was also completed to ensure the personal safety of the researcher. Chapter 5 gives an in-depth reflection on the safety and ethical issues of conducting fieldwork in China, specifically concerning digital surveillance.

1.6.1 Interviews

In 2018, the researcher emailed the headquarters of Digitech in Hangzhou and its corresponding office in Hong Kong, requesting permission to conduct interviews with officers in the public relations department. The emails were not answered. Later, the researcher rang the Hong Kong office[1]: the person who answered the phone acknowledged the request and promised to respond, but no response was forthcoming.

In the most ideal situation, research consent would be obtained from the organisation before fieldwork commences, but Digitech seemed to have no interest in allowing an external researcher to investigate its workers' experience. This might be due to this organisation's general culture of commercial secrecy, which is sensitive to potential damage to the corporate image if negative materials are revealed. Therefore, this research project was conducted

[1] The Hangzhou office does not list a public enquiry telephone number, so direct communication via telephone was not possible.

through a covert approach: the researcher blended into the field and obtained research consent only from the participants and not from the organisation they worked for. This grass-roots approach is commonly used in both academic and journalistic research (for example, Pun et al.'s 2016 research inside Foxconn's campus), and it is particularly useful for uncovering labour exploitation and abusive management practices in the workplace. For this reason, pseudonyms for both the organisation and interviews are necessary, in order to protect the informants and the researcher from potential backlash after his research findings have been published.

In addition to workers in Digitech, in order to gain a more nuanced understanding of the socio-political environment of China's internet industry, the researcher conducted semi-structured interviews with tech journalists, investors and industry veterans, as well as academics with similar research interests. Some of the interviews were with personal friends who the researcher has known for some years. The researchers' colleagues at the University of Cambridge have also referred some friends or relatives to him, and these people helped him to establish contacts in China. Altogether, the researcher conducted 61 interviews: 38 with workers or veterans of Digitech, 2 with investors in China's internet industry, 5 with tech journalists, and 6 with Chinese academic researchers who study similar topics. Nine informants were interviewed more than once. The interviews conducted lasted from around one hour to 90 minutes. Four interviews were exceptionally long, about two hours each. Before the interviews began, the researcher briefed the interviewees on the purposes of the conversation, how the interview materials would be used, and their rights as informants, and answered all questions they had. The interviewer also ensured that the informants' real identity would be anonymised and they understood their participation would be voluntary and without an honorarium. With the consent of the interviewees, the conversations were recorded on the researchers' iPhone, and he also wrote down interview notes, usually about interesting or important ideas that would benefit from further discussions, or something that was contrary to what earlier interviewees had said. The researcher conducted many informal interviews with a participant's friends or partners: this happened during social events (e.g., lunch gatherings) or when the researcher visited their homes. Because China's internet industry dominated by young workers (most new hires are less than 35 years old), the researcher found it easy to blend himself into the workers' social circle as he shares a similar lifestyle, particularly with those who were educated in Hong Kong or the UK. In these cases, a formal pre-interview briefing was impossible because it would have distorted the natural

environment of the social interactions, but whenever the researcher met a new informant, he introduced himself as a PhD researcher looking at China's internet industry, and let the person know he was visiting Hangzhou in order to conduct fieldwork for a doctoral research project. This ensured that the informants were treated with academic honestly. Appendix I provides a table with details of the interviewees on their gender, age, and seniority in the company.

Despite receiving a lot of help from these people, finding informants within Digitech, especially at senior management levels, remained challenging. The majority of interviewees were recruited through a snowball sampling method. Another strategy was going to the café within the headquarters building, or to events organised by the company, and talking to random people to make friends with them. Finding new participants is not easy, but this method helped expand the researcher's network beyond existing connections and enabled him to collect extra data through informal interviews. In addition, the researcher followed several social media (WeChat) accounts, in order to study the issues concerned by technology workers in their working life. Given that the researcher had limited opportunities for interpersonal contact with workers in Digitech, observations on digital platforms enabled him to develop trust with his interviewees and provided opportunities to further extend his Digitech network.

Choosing the right interview location is important because it provides insights into 'the relationships of the researcher with the interview participant, the participant with the site, and the site within a broader sociocultural context that affects both researcher and participant' (Elwood and Martin, 2000: 650). Whenever possible, the researcher tried to meet his interviewees inside Digitech's headquarters, because observing his research participants within their natural working environment can enhance both the quantity and quality of data collected. However, their offices are shared or open-format and, therefore, not ideal for interviews. Therefore, the researcher usually met interviewees at the coffee shop next to their offices, or made arrangements to conduct the interview over a meal, away from the headquarters buildings. On a few occasions, the informants' tight schedules necessitated online interviews.

Ideally, in order to capture the state's perspective in the tripartite model, the researcher would have conducted interviews with the government officials who are

responsible for the development of the internet industry, and with union representatives from the All-China Federation of Trade Union (ACFTU). Unfortunately, he did not have the personal connections needed to secure such interviews. He did not press hard to gain such access, due to concerns that, if the authorities became aware of this academic research project, they might selectively filter data, restrict his activities in China, or prevent him from leaving the country with the data (similar experiences are reported in Maria Heimer and Stig Thøgersen, 2006). More reflections on conducting fieldwork under conditions of state surveillance are discussed in Chapter 5.

1.6.2 Ethnographic observation

Rather than relying on one source of data, the researcher triangulated his interview findings with ethnographic observation in the workplace and with internet resources. Ethnography in work organisation or ethnographic observations in the workplace have long been important research methods to investigate the 'politics of production' (Burawoy, 1985) and the 'contested terrain' of workplace industrial relations (Edwards, 1979) in the manufactory setting. It is argued that it is impossible to fully understand the changing nature of employment, and the demands placed upon employees in the contemporary nature of work and employment without recourse to ethnographic techniques, especially on the cultural aspects (e.g., values, identity, ethics) of management (Brannan, Pearson and Worthington, 2007).

With the help of informants, he obtained a visitor's pass to Digitech's campus in Hangzhou. First, a Digitech worker submitted a request on the system and then registered the visitor (i.e., the researcher) with the company's security service. When the researcher arrived at Digitech's campus for the first time, security personnel verified his identity, collected bio-data, and asked to him sign a declaration declaring that he would follow campus rules. The pass contains a QR code that enabled the researcher to enter the campus within the registered period of time.

Ethnographic observation is commonly used by academics because it provides rich and contextualised understandings of work, with a variety of analytic foci, such as autonomy, citizenship, informal relations, meaning, environments, ethics and change in the workplace (Smith, 2007: 220). It involves not only gaining access to and immersing oneself in the social world of the participants, but also producing written accounts and descriptions of their world.

Especially when studying work and employment in society, researchers argue that this method is best for 'uncovering the tacit skills, the decision rules, the complexities and the discretion and the control in jobs' (Ibid.: 221). The site of observation for this study included offices, meeting rooms, coffee shops and common areas within the headquarters.

During the observation, the researcher regularly jotted down field notes with a pen and a notebook. His strategy was to quickly jot down keywords of a situation or an event as a reminder, and then write an extended description later. This approach minimised his intrusiveness and influence on the field, while in the field. For the same reason, as well as due to privacy concerns, he did not take any pictures of the people he observed. More than merely providing descriptions of a situation, the field notebook was also filled with the researcher's personal feelings and emotional reactions. While some scholars avoid the input of personal feelings in their ethnographic accounts, the researcher found this important to his research project. This is because the emotional focus on social life can provide 'rich accounts of the processual nature and full complexities of experiences which cannot be conveyed through descriptions of behaviours obtained by direct observations or interview questions alone. (Emerson, Fretz and Shaw, 2007: 361) These emotion-filled accounts eventually contributed to his methodological reflections, especially on identifying biases and prejudices and facilitating the reconstruction of features of the field during the write-up of this thesis.

In order to gain a better sense of the livelihood of internet workers in Hangzhou, on multiple occasions the researcher accepted invitations from informants – extended on the basis of friendship and hospitality – to social activities, including events in informants' homes. These events greatly enriched his understanding of working life in the internet industry and, at the same time, created new opportunities for deep conversations with additional Digitech employees. There are many advantages to establishing friendship with informants in qualitative research. Jodie Taylor (2011: 11) argues that:

> Regular and intimate contact [with informants] not only results in more opportunities to gather data, but it also increases one's level of perception in relation to body language and non-verbal communication; sensitive or covert topics; detecting false-truths' emotion behaviour;… and their intended meaning which may sometimes be obscured by incongruous or abstruse language, but it is able to re referentially

decoded through the researcher's intimate understanding of past events and/or their knowledge of the informant's personal history.

In the current research project, these friendship-based connections with informants often generated new and unexpected insights related to their personal life, which are difficult to obtain from a 'scientific' interview setting that stresses neutrality. Maintaining a friendship with the informants also enabled the researcher to have further discussions with them after the interviews, which was particularly useful for clarifying uncertainties that arise during data analysis.

Nevertheless, there are ethical issues to be considered before, during and after developing informant-friendship: Andy Bennett (2003) argues that the friendship might become an exploitative relationship because neither party, the researcher and the informant, might be fully aware of what the appropriate boundary should be in terms of disclosure, and thus whether informed consent has been adequately provided. This criticism, however, is rejected by researchers who adopt the friendship approach, because they treat informed consent as an ongoing process in research rather than a straightforward, one-time agreement (Wiles, Crows, Charles and Heath, 2007).

Lastly, although the researcher collected a lot of data during his visit to China, limitations of the fieldwork must be acknowledged. The COVID–19 pandemic presented a major challenge, as travel restrictions implemented within the city of Hangzhou limited accessibility to (and existence of) public events organised by Digitech. The researcher also shortened his stay in China from six months to three, due to concerns related to the fluctuating COVID situation and his personal safety. In fact, three months is a very short period of time for ethnographic research, and his time in Hangzhou (June to late August, 2020) was during the relatively relaxed period in the year, because sales targets in Digitech are reviewed in April and November. This timing, on one hand, was fortunate because the informants were more willing to take time to talk and socialise with the researcher; on the other hand, was unfortunate because the researcher were unable to observe workers during the stressful period and capture their work experience fully.

1.6.3 Media research

In order to situate the interview and ethnographic data within the wider socio-political context, the researcher conducted a series of newspaper searches on China's internet. He looked at China's state media outlets (CCTV, People's Daily and Xinhua News), in order to develop a better sense of the official discourses on the internet industry. He conducted news searches on each outlet's website and on Baidu.com (the Chinese equivalent of Google) with keywords such as '996', 'digital economy', 'internet industry', 'technology industry', and 'China's technology dream'. Instead of reading the actual policy documents, these news reports provided detailed yet easily understandable descriptions of the state's attitude towards the internet industry and issues surrounding it. This data can partially compensate for the absence of interview data from Chinese officials. During the media research, the author remained conscious that he should not totally internalise the language codes used by officials, as Heimer and Thøgersen (2006: 110–111) argue, if researchers want to know how Chinese people outside the bureaucracy think and speak, they must find ways to communicate with them in a 'normal' social and linguistic environment.

1.6.4 Data analysis

The analysis of the data began long before the researcher had finished his fieldwork, as new themes emerged over the course of the time in Hangzhou.

In most cases, the researcher created interview transcripts within forty-eight hours of the interview. This is because, when transcribing the conversation, he wanted to have a fresh memory of his interpretations of the interviewees' attitudes, reactions, and other behaviours that cannot be not captured in an audio-recording. Instead of using automated transcript software, the researcher created all transcripts in the old-fashioned way: listening to the audio and typing the exact wording into a Microsoft Word file on his laptop. It cost about 4–6 hours to finish one transcription, but the researcher believes this is a good practice for him because it makes him most familiar with the interview data and enables him to start immediately on data analysis in his head. Participant protection is at the base of another reason not to use automated transcript software: uploading the recordings to a third party would comprise an unnecessary risk of data leakage.

Coding was done by using Microsoft Word on the researcher's laptop, using files he created as repositories for data associated with the emerging themes (e.g., pay, working hours, workplace relations). According to Braun and Clarke, 'A theme captures something

important about the data in relation to the research question, and represents some level of patterned response or meaning within the data set' (2006: 82). Relevant materials from transcripts and pasted into the thematic files. This method is easy, and it facilitates the thesis writing process by summarising the information in one file. During the coding process, the researcher paid particular attention to the contradictions presented by an interviewee or between two interviewees, to prevent over-simplification of the real situation. For example, one interviewee said she thinks that work in the internet industry has always been demanding, but she also said her colleagues slack off at work from time to time. In addition, instead of extracting a single sentence from our conversation based on particular keywords, the researcher constantly reminded himself to include the context where a particular statement was made. This can prevent the creation of biases due to the conflicting social, cultural and political backgrounds of the researcher and the interviewees; presenting the context is crucial to ability of this thesis to communicate accurate understandings of statements made during interviews.

As the analysis began, the researcher encountered unanticipated challenges: some emerging themes were unexpected. For example, some female interviewees mentioned that the most unfavourable condition for this job is they cannot find a romantic partner. This is not only due to the long working hours, but also because jobs in the internet industry are relatively highly paid, and they expected their romantic partner to bring home an even bigger paycheque. To analyse these gender-specific themes, it became clear that more knowledge of the gender relations in contemporary China was needed. To this end, follow-up discussions were initiated with six female and three male informants, and included questions related specifically to gender politics in China's internet industry (see Chapter 4).

1.7 Outline of the thesis

This thesis comprises six chapters and three appendices.

In the first chapter, the theoretical context and motivations of the study are introduced. In addition, theoretical linkages among the three research articles (Chapters 2, 3, 4) are presented and the distinctive contributions of the pluralist IR approach to analysing the impact of digital technology in the workplace is explained. It then elaborates the research

design, justifies methodological approaches adopted to address the research questions, and explains what measures are done to address the methodological limitations in this project.

Chapter 2 deals with the first research question, which looks at the state's influence on work conditions in China's internet industry. The chapter demonstrates the Chinese government's significant role in shaping the collective work experience in business reality. The empirical findings suggest that the state's quest for technology supremacy has resulted in internet companies that compete ferociously, which in turn causes extreme working hours and burnout among employees in this industrial sector. The article version of this chapter was published by the *Journal of Industrial Relations* (CABS 2, SJR Q1) in January 2022.

Chapter 3 addresses the second research question as it documents the working conditions and experiences of tech professionals at DigiBuy, arguing that the digital management of technology workers can be understood as 'digital Taylorism', which has similar pathologies to the original Taylorism: a dehumanising effect on the workplace, increased work intensity, a higher income but proportionately lower share of the gains from increased productivity, and intensified competition among workers. The article version of this chapter was published by *Economic and Industrial Democracy* (CABS 3, SJR Q1) in February 2022.

Chapter 4 concerns the third research question and looks at an online petition that was signed by more than six thousand technology workers in August 2021. It argues that the rising awareness of women's rights in China provides a new legitimacy to labour activism, but that feminist consciousness in workplace contexts is highly dependent upon individual experiences and, therefore, that collective actions tend to be event-based and of limited continuity. As a result, even when feminist–labour synergies emerge, they generally fail to deliver institutional changes. This chapter was published in article form by *Gender, Work and Organization* (CABS 3, SJR Q1) in May 2022.

Chapter 5 is a reflection on conducting fieldwork in China while under digital surveillance. It discusses how digitally-mediated state control of citizens and society are affecting fieldwork and categorises two types of digital surveillance: 'digital profiling' and

‘digital monitoring’. The *Journal of Contemporary Asia* (CABS not listed, SJR Q1) published the substance of this chapter in 2022.

Finally, the findings and conclusions are discussed in Chapter 6. This chapter reflects on the literature review and discusses the project’s contributions to industrial relations scholarship and academic debates on the future(s) of work. Lastly, the chapter elaborates on the policy implications of this study and indicates directions for future research.

Appendix I is a scoping review of literature, examines recent technology and industrial relations studies to highlight the knowledge gap and provide the methodological justification of this doctoral research project. It shows that few studies probe the impact of new technologies implementation on the work experience of salaried tech professionals, and even fewer probe these impacts in developing country contexts.

Appendix II shows the interview questions, and Appendix III provides information about the informants who participated in this project.

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Chapter 2 The role of the state in influencing work conditions in China's internet industry: Policy, evidence, and implications for industrial relations

Abstract

While there is growing scholarly interest in work conditions in China's internet industry, many studies have focused exclusively on corporate employment relations strategies. By contrast, the article demonstrates the Chinese government's significant role in shaping the collective work experience in business reality. Drawing on three months of fieldwork in China, the findings suggest that the state's quest for technology supremacy has resulted in internet companies that compete ferociously, which in turn causes extreme working hours and burnout. The censorship of online labour activism and the ambiguity in court decisions also lower the interest of technology workers in organising and defending their labour rights. This study opens up an evidence-based debate on industrial relations in contemporary China and calls for more discussions on the state's role in shaping worker well-being and protection.

Keywords Industrial relations, contemporary China, internet industry, digital labour, online activism, labour policy, work conditions

In recent years, there has been growing scholarly concern with the work conditions in China's internet industry. Research points to several problematic management practices: long working hours, high work intensity and intense competition, to name a few (Li, 2019; Lin, 2020; Sun and Magasic, 2016; Xia and Kennedy, 2014). Scholars have noted the appearance of industrial relations tensions that accompanied the rapid growth of internet enterprises in China, but their research generally has been limited to investigations of employment relations in these companies, for example, the antagonism between software capital and grassroots programmers (Sun, 2017). Scant attention, however, has been paid to the state's influence on collective work conditions in business reality. This study seeks to initiate discussions that will fill that gap.

Some argue that the effects of state regulation have been ignored due to an inherent bias in industrial relations studies that build on the tradition of tripartite theory established by Dunlop in 1958. Hyman (2008), for example, argues that Dunlop and his followers of pluralistic industrialism place key explanatory emphasis on the economic and technological aspects of industrial relations because these factors 'create convergence toward a common model of regulation ... in which employers and unions developed increasingly effective and non-conflictual bargaining relationships, making detailed state regulation unnecessary' (Hyman, 2008: 259). In practice, over the past half-century, a significant amount of research emerging from this school has focused on the negotiation between employers and unions, giving the appearance that industrial relations analysis can be detached from the political environment, especially in the prevailing market-oriented economy in the world nowadays. This study, however, argues that government continues to play a significant role in shaping industrial relations by manipulating the business environment. It focuses on the political economy of China's internet industry and investigates how the state's power indirectly affects the collective work experience of internet workers. The empirical analysis draws on three months of fieldwork in Hangzhou, China's tech cluster, where the researcher met and conducted in-depth, semi-structured interviews with technology workers in a leading internet enterprise called Digitech (pseudonym). The analysis was enriched with interviews and informal conversations with Chinese tech journalists and investors, as well as personal observations while in the field.

This article builds on that of theorists who argue that markets in capitalist economies, including labour markets, are the result of the deployment of state power, therefore, they are politically constructed (see, e.g. Hall, 1986; Polanyi, 1944). Through this lens, China's internet industry is seen as more than merely a form of business activities; rather, like Kennedy (2020), this paper suggests that work in this 'industry should be understood as politically constructed activities that further the state goals of 'revitalising China' and pursuing 'China's technology dream' (*kejimeng*). This perception is essential to understanding why the Chinese government has favoured employers over workers in the internet industry and shown ambiguity in enforcing regulations related to internet enterprises' misbehaviours.

In what follows, this paper presents the research background and policy initiatives for developing China's internet industry, arguing that since the 1980s, Chinese officials have perceived information technology (IT) as a symbol of national strength. It then examines the implications of this perception for industrial relations and its indirect impact on the collective work experience in the internet industry. By use of this case study, this article hopes to invite more evidence-based discussions on industrial relations in contemporary China.

Re-examining the state in China's industrial relations system

To some theorists, the state is seen as a critical actor in industrial relations because it establishes the basis of orderly operation of labour relations and labour legal protection (Hyman, 2008: 260). As Ravenswood and Kaine (2015: 548) summarise, the state has traditionally been seen as performing three main functions in industrial relations: setting the boundaries of labour law and minimum employment standards, arbitrating and thereby limiting the extent of industrial conflict, participating directly as an employer by establishing public sector industries. Recent studies also pay attention to the effort that governments make in (de-)regulating the market and fostering citizenship and voice at work (see Hyman, 2018). However, a major criticism of these studies is that the pluralist model of industrial relations is built on the Western socio-political context, in which the state is usually a moderator that seeks to balance the power between employers and workers. In these societies, the state acts as a guardian of public interests, and bargaining power is usually diffused among the three institutions (workers, employers and governments) in a way that none dominates the others.

However, China is different; here, power is in the hands of and strictly controlled by the Party-state.

China's industrial relations system has been undergoing a dramatic change over the last two decades. With the deepening of marketisation and economic liberalisation, the role of China's Party-state presumably has become less influential in the market-oriented economy. Wei (2017: 114) even argues that the Chinese industrial relations system is gradually showing some signs of convergence with liberal economies such as Britain and the United States. Indeed, many researchers have conducted macro-analyses that explore how policies implemented during the transition have affected the power relations between the state, capital and labour in state-owned enterprises. Some of this work has shown that corporate privatisation has fundamentally changed the nature of state– worker relations and, as a result, the job security and living standards of many current and former state workers are increasingly under threat (Cooke, 2008). This literature has shed light on the conflict of interests between the state and labour during downsizing, which has been a key tension in China's industrial relations system during the transitional period. The role of the state, however, becomes less clear to academics who investigate industrial relations in 21st century China.

Meanwhile, researchers also are concerned about the role of the All-China Federation of Trade Unions (ACFTU) in promoting workers' rights and defending workers' interests (Chang and Brown, 2017; Chen, 2003; Taylor and Li, 2007; Wang and Elfstrom, 2016). However, they come to very different conclusions about its impact on China's industrial relations system. While some suggest that the ACFTU acts merely as 'a pliable instrument of the state whose priority is to serve the state's goals', others believe the ACFTU has 'become more representative of their membership and more independent of the state control' (see the review by Chen, 2003: 1007). In this connection, Taylor et al. (2003) propose a four-party model (state, employer, trade union and workers) and suggest that the ACFTU and workers should be treated as two independent actors when investigating the industrial relations dynamic in China, as the union does not necessarily represent the interests of workers in reality. Later, Ma's (2011) six-party model of industrial relations (the Party-state, the ACFTU, employer organisations, grassroots unions, employers and employees) expands the scope of study to other grassroots labour organisations. However, a limitation of this

literature is that such ‘unionisation’ is a communist legacy and usually exists only in particular segments of China’s labour market, usually in blue-collar sectors such as construction or textile manufacturing. As the Chinese economy gradually transforms from the industrial economy to service and on to today’s digital economy, the ACFTU has become less relevant and increasingly incapable of protecting workers’ rights and settling workers disputes in the emerging economic sector, such as tech work in the internet industry.

During the period of economic transition, as Zhou (2013: 355) observed, workers have become increasingly precarious due to the massive growth of informal jobs in the labour market across all economic sectors, which is characterised by the prevalence of temporary work, casual work and freelancing. Consequently, there has been an intensification of labour conflicts in China, which has generated considerable pressure on governments at all levels (Fuchs et al., 2019). In response, the state has expanded its intervention in the industrial relations system, in order to regulate labour conflicts and maintain social stability. Some of these interventions have supported workers, including the China Labour Law of 1995 and the Labour Contract Law of 2008. The Labour Law outlines the legitimate rights and interests of employees in China, for example, workers shall not work for more than 8 h a day and no more than 44 h a week (Article 36), and the Contract Law regulates the nature of contracts and increases severance payments to fired workers. Researchers believe that such policy instruments can provide protection to some vulnerable workers, although there is noticeable evidence that some employers avoid or sidestep the compliance through different cost-minimising strategies (Gallagher et al., 2015; Wang et al., 2019). Zhou (2013: 367) gives a powerful example: Chinese tech enterprise Huawei laid off more than 8000 employees and rehired them under new contracts in order to pre-empt the impact of the Law in 2008. Despite the state’s effort, labour activism against workplace exploitation remains common in China. The Hong Kong-based China Labour Bulletin (n.d.) regularly updates a map of strikes and other labour actions throughout China. The map documents more than 13,000 such actions since 2010, including 500 in 2021.

In this regard, a few researchers have attempted to re-examine the role of the state in the Chinese industrial relations system by looking at the governments’ responses to labour activism. For example, Taylor et al. highlight four distinct roles the Chinese state play in labour relations: regulation, monitoring, damage control and mediation and arbitration (2003:

29–35). Recent research also argues that the Chinese government adopts a 'bifurcated strategy' to demobilise labour activism: on the one hand, the state enhances the protection of individual worker rights by legislation; on the other hand, it prioritises mediation over adjudication, which 'allows local state actors to work together to provide flexible and swift solutions to disputes' (Chen, 2016: 35). In addition, Fuchs et al. (2019) point out that in the current administration, Chinese governments have become more aggressive in controlling and repressing labour activists, academics and civil society in China. This includes police crackdowns on labour non-governmental organisations in 2015 in the cities of Guangzhou and Fushan, and the mass arrest of labour activists and undercover researchers in 2017 (BBC, 2017).

Despite these and many other institutional efforts to quell dissent, a fierce online campaign broke out in March 2019 to protest against the exploitative work conditions in the Chinese internet industry. This event is often referred as to the 'anti-996' campaign by media and local writers. '996 scheduling', as its name suggests, requires employees to work from 9 am to 9 pm, six days a week. This protest suggests the 'carrot and stick' strategy of the Chinese government is ineffective to technology workers, therefore, a re-examination of the state in the internet industry seems to be necessary. Precisely, this study aims to address three research questions:

1. Why is the internet industry important to the Chinese government?
2. How do China's technology workers perceive and experience the state's influence on industrial relations?
3. How do these perceptions and experiences affect their collective actions in the internet industry?

Labour struggles in China's internet industry

While Chinese tech enterprises profited tremendously from China's pursuit of its technology dream, work in the tech sector remains highly competitive and exploitative. Moreover, the Chinese government often overlooks the sacrifices of technology workers. Although local journalists have occasionally reported on over-work and collapse at work in the internet industry, the work conditions and labour unrest in the Chinese internet industry have, thus

far, not been the object of much academic research. Both research and research findings are fragmented because technology parks in China are spread across different provinces with significantly different socio-political conditions. A structural analysis has not yet been seen, and what is particularly missing in the discussion is how government initiatives are perceived and experienced by technology workers as individuals. Individual experiences combine to affect collective work experiences, perceptions and actions within the industry.

While official discourses often highlight the bright side of working in China's internet industry, many researchers are concerned about the actual experience of workers in the internet industry. Indeed, their research often documents the unfair and exploitative treatment of IT employees. Based on Xia's fieldwork in two internet companies in China, Xia and Kennedy (2014: 165) conclude that 'working conditions in the Chinese Internet industry are not good', because 'even though these workers devote themselves to their industries with such long working hours, they are not rewarded with salaries comparable with workers in state-owned enterprises or companies borne out of foreign investment'. They also discovered that state intervention directly causes difficult conditions for inter- net workers, for example, by censoring media content.

In addition, labour processes serve to construct the professional and social identity struggles of programmers in small tech companies in Shenzhen. Sun and Magasic (2016) show that while programmers in India and the West are usually well-educated and come from a middle-class background, Chinese code writers in small tech companies have fewer years of education, graduate mainly from lower-ranked universities, and work in an environment characterised by long and stressful hours. A more recent account is provided by Li (2019), who argues that industrial restructuring in China's internet industry since 2018 has fuelled increasing resentment and disappointment have accumulated in Chinese technology workers. These workers had been motivated by the 'big firm dream', believing that overtime work could provide them with good salaries and opportunities in the future, but they now believe they were 'betrayed' by their companies when business downturned.

These internetwork struggles have remained unsolved over the years and in 2019, as the technology boom in China was slowing down, the dissatisfaction researched the boiling point. Declining salaries, the slashing of bonuses and benefits, and even mass layoffs in some tech companies (Bloomberg, 2019) eventually ignited a massive online campaign in China.

On 26 March 2019, a new user '996icu' created a project on Github.com, a Microsoft-owned open-code-hosting forum commonly visited by programmers around the world. As the project website stated in simplified Chinese, 996icu means 'the 996 schedule of work risks workers to the ICU (Intensive Care Unit)', with an endnote, 'Developers' lives matter'. Within a month, this project went viral on Github.com, with thousands of workers flooding to the website to join the discussion, mostly making complaints about their job conditions.

The controversial 996 issue was also widely discussed on Chinese social media platforms, including WeChat and Weibo (the Chinese version of Twitter). This attracted considerable journalistic attention, including the Chinese state media. It is very rare, if not unique in contemporary China, for the state media People's Daily to show their support for labour activism and to criticise the extreme work culture of the country's internet industry (Lin, 2020: 55). In May 2019, the controversy met the state's pushback as more offline actions started to take place. These included sending open letters to local governments to demand their actions regarding 996 scheduling, and sending Chinese tech guru Jack Ma copies of the labour law to shame his support for the 996 management practice. The Chinese government quickly filtered 996-related discussions online on both sides; they blocked 996icu's account and removed Jack Ma's provocative view. The 996 work practice, however, is still considered to be entirely normal in Digitech and the Chinese internet industry today.

Although these scholarly works and journalistic reports on 996icu provide a better understanding of Chinese technology workers, in reality, some important questions related to the structural features of the internet industry remain unclear: scholars have not clearly mapped workers perceptions of competition within the industry, nor have they offered clear explanations of collective actions or changes in government positions. The discussions in this article intend to contribute to an empirical explanation of phenomena in China's internet industry from the practitioners' perspective.

Research design and methods

In order to answer the three research questions, complementary research methods are used. First, primary and secondary sources are used to support the argument that since the 1980s, the Chinese government perceived that global success of an internet industry would yield both economic and symbolic value. Hence, it devoted more resources to the industry's

development as a political project than might have been justified on the basis of jobs creation alone.

The second and third questions are discussed in the context of a case study of Digitech. A case study approach was useful to indicate particular industry issues experienced by the workers, which will be discussed in the research findings. In-depth knowledge of Digitech was gained during three months of fieldwork in China, including a two-month visit to a giant internet enterprise located in the city of Hangzhou for interviews and workplace observations, and about one month spent in Shanghai for mandatory quarantine, two COVID-19 tests and other paperwork.

Digitech was chosen for three reasons: First, it is one of the largest enterprises and employers in the industry, with over 20,000 workers. Also, its business includes online retailing, e-finance, communication and entertainment, all of which are central to government policy initiatives. Second, Digitech is one of the biggest corporate taxpayers in China, a consideration that deepens the government's interest in its activities. Third, it is one of the pioneers of the 996 still-dominant work schedule. As such, Digitech is an excellent example of the collective work experience as well as the relationship between the state and an internet business in China.

Because the political processes in authoritarian regimes often remain hidden, interviews are a key method to obtain some clarity about reality (Shih, 2015). In this study, the researcher conducted 19 semi-structured interviews with Digitech workers (codes: W1–W19), in order to understand the state influence on the internet business from the workers' perspective. In addition, he interviewed two venture capital investors (codes: V1 and V2) and four tech journalists (codes: J1–J4) who provided a more comprehensive description of the industrial structure and policies and also enabled triangulation of the data collected from the workers. While some workers were reluctant to talk about issues related to collective action, the tech journalists were relatively comfortable as they expressed their ideas on these topics. The interview themes focused on their work experiences in the internet industry, their interpretation of the state's policy, and their opinion of the 996 scheduling and collective actions. Each interview lasted from one to one and a half hours and was audio-recorded with the interviewees' consent.

In the next section, it documents the influence of the government on the trajectory of the Chinese internet industry. It provides a historical explanation for why the Chinese government treated the internet industry differently: this industry supported both economic and symbolic objectives, which is portrayed as China's technology dream in the official policy discourse today.

Developing the Chinese internet industry: A four-decade China revitalisation project

The state project of building the internet industry can be traced back to the official discourse on the process of 'informationalisation' in the 1980s (see Law Info China, 2009). Following this path, IT was believed by Chinese leaders that it is the foundation of Chinese competitiveness in the 21st century, just as it was elsewhere at the end of the 20th century, when China witnessed the impact of the internet and information and computer technology (ICT) employed on a mass scale in Europe and the US. (See Dai, 2003 for the historical review of ICTs in China's development strategy.) However, the technological level of China's IT industry was perceived to be significantly lagging behind at that time. In his in-depth investigation of China's technology industry, Kessler (2007: 212) recited his interviewee's description of the technology industry in this early period: 'There was no Chinese programming industry, [...] the Chinese, the level of the people, the technical level was backward. You had people working on way out-of-date PCs'.

Nonetheless, the Chinese government was determined to develop IT for economic and social transformation. This can be seen in policy documents such as the five-year plan for 2001–2005, which stresses that the government 'needs to selectively stimulate development of new and high-tech industries such as information technology' (The National People's Congress, 2010). In 2001, the Internet Society of China (ISC) was established, a state-employer association under the leadership of the Ministry of Industrial and Information Technology. It started with 70 member institutions, including the major Chinese internet service providers, internet companies and universities, to serve 10 political purposes, including advising government's internet policy direction, establishing human resources programme for internet enterprise, and monitoring compliance of inter- net enterprises with Chinese laws (see Internet Society of China, 2011). A government official was appointed as

the head of ISC, which enabled the Party-state to steer the development direction of China's internet industry by compelling its members to comply with so-called self-enforcing regulations, instead of relying only on legislation.

In this regard, internet enterprises and their corporate behaviour have never been free from state monitoring and control. This 'arms-length' approach is believed to be important to attract foreign companies and investment into China's IT and technology industry, in order to bring in foreign technologies and nurture its business environment. These foreign investments are proven to be crucial to the success of Chinese tech companies, as most of the leading players in China's internet industry have strong capital relations bonds with various foreign investment banks and shareholders today. As the Chinese economy continued to open up, the influx of foreign firms and investment into the IT and tech sectors has transformed the labour market by promoting competition for talent, which led to dramatic wage increases and a high rate of turnover (Kessler, 2007: 214). Despite more young people were graduated with IT-related degrees in China during this period of growth, as observed by Kessler (2007: 210–211), there was a shortage of talent, especially tech engineers, mainly due to the harsh reality that these companies avoid older workers (aged 35 years or above), who are associated with being inefficient.

Two additional policies were introduced in 2015. First, China's Premier, Li Keqiang, introduced the 'Internet Plus' policy, which aimed at promoting the integration of Big Data, cloud computing, mobile internet, and the 'Internet of Things' as 'a new engine for economic growth'. According to the official XinHua news channel (XinHua Net, 2017), the policy is intended to encourage economic transition and to enable China to become an 'innovative' (*chuangxin*) country by promoting the use of automation and Big Data across all business sectors in China.

Then, in May 2015, the central government launched 'Made in China 2025' to boost its 'hi-tech industries', especially focusing on the production of industrial robotics and intelligent machines, with the aim of dominating global hi-tech manufacturing and exports in the near future (DW, 2015). Businesses in 10 selected hi-tech industries, such as 5G communication technology, robotics and artificial intelligence (AI), received considerably government support in order to speed up the country's technological transformation. China's

goal is nothing less than to become the world leader in technology development. The Chinese government also believes that the new industrial policy will 'upgrade' the labour market in China by bringing in more talent into the technology sector (Ministry of Education, 2017).

It is estimated that in 2019, 20 million people worked in the internet industry in China, including 4.55 million people in state-owned enterprises in the Information Transmission, Software and IT sector (National Bureau of Statistics of China, 2020). Similar to the West, researchers estimate that China's internet workforce is predominated by men, and women account for only 15% (Sun, 2021).

In particular, the Chinese government has revealed its ambition to transform the national economy by allocating an enormous amount of funds for R&D in AI and related technologies. China Telecom (2018) expected these investments to be up to 2.5% of its gross domestic product by 2020, and they were being made while the government was also recruiting talent from overseas through the Thousand Talents Plan. In 2017, as President Xi Jinping reiterated his dream for China to become a science and technology superpower (XinHua Net, 2017), the State Council issued the 'New Generation AI Development Plan', formalising and enshrining the investments in policy and signalling its prioritisation of policy support for AI development. This plan is also sometimes referred to as 'China's technology dream', and sets the benchmark for the AI industry in China with the government's expectation that the industry's level of development will be comparable to that of the most advanced countries and would contribute an economic value of 150 billion CNY (23.3 billion USD) by 2020.

As commentators (Fannin, 2019, chapters 1 and 2) argue, with these government initiatives, the huge domestic market, the huge labour pool of qualified university graduates, and a culture of hard work among Chinese technology workers, China clearly has become a major player in the global race for technological supremacy, and especially so when it comes to AI research and development (see also the review by Liu, 2021). According to a report by Tsinghua University (2018: 2), 60% of global AI investment from 2013 to 2018 was invested in China, making it the largest market for AI start-ups in the world. Meanwhile, technology workers also benefitted from the policy initiatives and the rapid development of the industry. For instance, in 2019, the average annual income for an employee working in government-related enterprises in this sector was about 161,000 CNY (25,000 USD), which is

significantly higher than the national average of 90,500 CNY (14,060 USD) (National Bureau of Statistics of China, 2020). However, despite its rapid development over the last few years, knowledge about the industrial relations of the internet industry does not go much deeper than statistics (e.g. employment figures), and in-depth understanding of how the policy shapes the actual working environment of technology workers, and how practitioners make sense of the government initiatives, remains insufficient.

Intense competition in the Chinese internet industry

This study finds that the substantial investment by the Chinese government – including 270 billion CNY (42 billion USD) in Shanghai in the next three years and 5.56 billion CNY (0.86 billion USD) in Guangzhou for 16 new infrastructure projects (China Briefing, 2020) – has succeeded at fuelling the growth of internet enterprises in China. The state also fenced off new competitors, which allowed several selected Chinese enterprises to maintain their strategic advantages in their respective technology domains. Facebook, YouTube, and Google are well-known examples of this technology protectionism, as government prohibitions against all of them are enforced by China's internet 'Great Firewall'. Because internet markets are politically constructed, government involvement has reduced the disruptive social consequences of marketising the economy. But this politics-dominated market has generated disruptive consequences of its own, as explained by V1, a venture capital investor in the technology industry for eight years, on what he believes to be the government's logic in developing the internet industry:

> Although there is no competition law in China, [...] these companies won't become the monopoly. There will always be two to three major competitors in one particular domain. Take e-commerce as an example, you have Alibaba, JD.com and PinDouDou, [...] so that these companies have to keep innovating, designing new products, keeping up the pace.

Interviews support the contention that this intense competition in the domestic internet market is one of the root causes of burnout of technology workers and labour dissatisfaction in China as a result. In order to survive the highly competitive business environment, internet enterprises believe they have no choice but to demand ever-greater productivity from their workers, which has led to high work intensity and extremely long working hours. From this

viewpoint, the 996 work schedule is an indirect consequence of the Chinese governments' policy initiatives.

> The reasons for our long working hours, firstly, it is due to competition. [...] If there are two similar products, one is launched before the other, it will have advantages. Every company wants their product to be released sooner than their competitors, so we have to work for long hours to speed up the development.
>
> (W5, senior programmer)

> We have long working hours because we are still developing our market [...] I believe Microsoft has long working hours before its products dominated the market. When our company becomes the next Microsoft, then we can enjoy a slower pace of work.
>
> (W6, senior programmer)

Others mentioned how competition causes burnout at work.

> In the internet industry, we spend more time with our colleagues than our families. This is no exaggeration. We spend thirteen to fourteen hours on work every single day, and maybe ten hours at home, including sleeping. It is very difficult for us to balance our job with family duties.
>
> (W5, senior programmer)

Regulating work in the internet industry

As the researcher observed during his visit to the office, the interviewees on average spend at least 10 hours at their office per day, five to six working days every week. Both their contracts and their paycheques indicated that they worked no more than 8 hours per day and 44 hours per week, the legal maximum, all interviewees agreed that this work arrangement is normalised in the internet industry. This work model is a flagrant violation of 'China Labour Law' article 36 (see Law Info China, 2012 for the 'Labor Law of the People's Republic of China [Revised]'). All interviewees were aware of the Law, and some (V1, V2, W2, W5, W14 and W16) suggested that internet companies have strategies to bypass the Law. This can be done, for example, by using a project-based management method. This method contracts a

worker to complete a well-defined and measurable project by a certain date and specifies the number of hours that will be paid for the delivery of a completed project. Beyond this, employees are free to structure their time 'however they choose', but the project can be completed on time only if a 996 schedule is chosen. On other occasions, managers have claimed that workers love their company and their jobs, and their sense of passion inspires them to work more hours than they are paid for.

As more journalistic attention is attracted to the extremely long working hours in the internet industry, tech gurus such as Jack Ma (founder of Alibaba) and Ren Zhengfei (chief executive officer of Huawei) have doubled down on their support of exploitative management practices in their organisations. For example, Ma recently said that 'overtime working is a huge blessing' because 'many companies and many people don't have the opportunity to work 996' (CNN Business, 2019). Ren mentioned that his employees must be 'aggressive as a wolf' and 'non-stoppable before their tasks are finished' (NY Times, 2018). Interviewees were well aware of Jack Ma's and Ren Zhengfei's inflammatory statements and confirmed that recruiters had made time expectations clear at the time they were hired. In Digitech, W8 'was told that I need to work overtime at the recruitment fair. The recruiting officer said I won't be paid for the overtime, and it is up to me to decide whether or not I find this practice is acceptable. If not, I should not take the job offer'.

Surprisingly, despite the 996 controversy stirring in society since 2019, both the central and local governments seem to be ambiguous in enforcing the Law and regulating working hours in the internet enterprises. This is reflected by the ruling of court cases on 996-related disputes in China. As Wang and Cooke (2017) argued, the Chinese legal system is based on the civil law system, therefore, the law itself is relatively abstract and there is a level of dependence on judicial interpretation when handling labour disputes. In this connection, the interplay between the court, workers and the ACFTU on ruling to some degree can show the authority's manifestation of the politico-legal attitudes towards the 996 practices.

As this article goes to press, the number of court cases related to 996 disputes continues to be unknown. News related to 996, including the anti-996 campaign platform, was selectively filtered and blocked by search engines in China, so the exact number remains unknown to the public. Information sourced from the Chinese internet suggests there are at least three court cases related to the 996 disputes in China (Sohu.com, 2019). The

contradictory rulings by the district courts in these cases, one for the employee and two against, suggest that the legislative framework in China is not in a position that can stand firmly to defend workers against the inhumane and unlawful working hours. Wang and Cooke (2021) found a similar level of arbitrariness in court rulings in labour disputes between Chinese platforms and their workers.

Interviewees interpreted the court arbitrariness in a variety of ways. Some believed it should be the employer who takes the blame (W3, W4 and W11), but others highlighted the complicated interests between the state, employers and workers.

> I don't think the government will actively engage in these issues (of labour dissatisfaction). It is because the government is relying on tech companies to pay their taxes. If overtime work can create more value to the company, which means the company can create more revenue, and they consequently will pay more tax.
>
> (W8, asset manager)

For instance, according to the official news outlet, the Alibaba Group paid more than 250 billion CNY (38.9 billion USD) tax in 2018, which is more than the total tax collected in Hangzhou (Xinhua Net, 2019). Another important source of income, senior programmer W6 believed that

> governments today, including the Chinese or others overseas, do not want to interfere internet companies. Overtime work is one way to help internet companies in their country to win the global race of technology development. All of them want to be ahead of others.

Some also believed that the urgent need for technological advancement compels government flexibility as it regulates internet company practices. Freelance tech journalist J1 gave an example based on one of her previous investigative reports.

> The Chinese government will let those tech enterprises do whatever they want unless something very wrong happened. [...] There was a case that a tech enterprise accessed medical reports from citizens in some provinces of China [for building its data base]. This is not legal nor illegal, because there is no regulation on this issue.

However, despite technology workers appearing to enjoy much flexibility in software R&D at work, the state still has a firm grip on the industry, especially for online content. As W17 described her experience in developing online games, 'all in a sudden, the government will change the (video game) regulation and we must comply. There is no discussion before the implementation and we have to redevelop projects again. Sometimes, we find it hard to follow'. This echoes Xia and Kennedy's (2014) finding that state intervention on content has directly exacerbated conditions for internet workers.

Unionising internet workers for collective action: An impossible mission?

Lastly, a few interviewees mentioned the importance of the union in fighting against their employers to lower the working hours, but others believed it is 'so difficult for union members to investigate the phenomenon because it is not written in black and white on the contract' (W8) or 'the company can always find a way to dodge the regulation' (W4). None were able to recall any measures the ACFTU had adopted to support technology workers, and they believed tech companies to be 'too powerful to touch' (W8) or the 'situation is too sophisticated' (W4). There is also a sense of distrust of the ACFTU. When the interviewer asked if there is any possibility for the Unions to organise workers fighting against the illegal workplace exploitation, VC2 replied, 'the Unions are supposed to help poor people [such as rural migrant workers]. [Because technology workers are relatively well-paid,] this is not its priority'.

When the interviewees were asked if there is any possibility of collective actions against the technology industry's exploitative management practices, some of them became very cautious (e.g. CV1 asked the researcher to stop recording, W6 asked 'is this a topic we can talk about?' and W19 stated, 'I do not want to comment on politics'). Some internalised the long working hours and saw them as being necessary for tech work, and a few of them jumped to the conclusion that there is nothing workers can do 'because this is the way it is' (W18). Others suggested measures such as asking colleagues in the same team to work slowly together or to transfer to another business groups as a team, but these methods do not have any meaningful effect on industrial relations. Software developer W18 believed unionising workers to fight for their rights is impossible, because her employer can just lay off every 'troublemaker' and can easily hire others 'who are cheaper, younger, easy to manage and willing to work overtime, want to work for this company'. This is particularly

the case since the growth of the internet economy began to slow down: ‘everyone needs to keep their rice bowl’.

None of the interviewees thought about labour unionising themselves. This is partly because of the internet censorship on 996 news, which W7 interpreted as ‘the red line of the government’. In addition, the court rulings related to 996 disputes make technology workers in internet companies feel that they have no legal ground to act collectively against their employers. User analyst W12 is among those who shared his opinion less defensively, saying that the biggest challenge for unionising workers actually comes from the government. When asked if he saw any possibility for collective actions, he replied,

> you asked me if there will be one hundred people to form a union? To negotiate with the employer for shorter working hours? This is IMPOSSIBLE! It is not just an issue concerning one hundred people; it is about everyone in the industry. If it is a matter of the ten million people working in the internet industry, you will see it is impossible under the current political environment in China. It means instability, and the government will not allow it.

Researchers investigating industrial relations in China argue that collective actions by Chinese workers are difficult, because these activities are usually limited by the only legitimate organisation – the ACFTU, which is under the Party’s control and often subordinates worker interests to those of the state (Taylor and Li, 2007). Instead of protecting workers’ collective rights such as associational power, Chen (2016) has argued that the Chinese government has been focusing on the protection of individual rights by, for example, establishing the minimum wage policy and the Labour Contract Law in 2008. In this connection, the ACFTU has played a role in promoting personal labour rights and providing legal advice to individual workers in employer–employee disputes. These measures, however, have not yet been seen in the 996-related disputes. While the 996 work pattern is such a common experience for technology workers (according to the interviewees and news reports), why have there been no industrial actions (e.g. strikes) in the internet industry, given that both their individual and collective rights have been infringed?

This study found two explanations of this phenomenon related to the political economy of China’s internet industry. First, it is related to technology workers’ professional identity. The political discourses promoted by the state see workers in the technology

industry as ‘dream makers’ (*zhuimengzhe*) who want to build a better future for China. During the fieldwork, when the interviewees talked about what do they like about their job, or whether they think their job is a profession, a common theme of their answers was that they believe their job is empowering China’s technology dream and the future economy of China. This suggests that their work is motivated not only by monetary rewards but also by intrinsic values, such as a sense of patriotism. Also, some interviewees told the researcher that they feel a sense of satisfaction when they finish their project, and the unfavourable working conditions they have to bear are the unavoidable sacrifices as they engineer China’s technology dream. This is very different from industrial actions by factory workers, whose participants were motivated primarily by salary and were highly alienated from the products they made (see, e.g. Chan et al., 2020).

> I think this is the career of my life. What I am doing is empowering the service industry in China.
>
> (W3, project manager who is developing an AI e-commerce system)

> Over the last four years, I have been working overtime because my product is not stable. [...]We want to [use this software to] help all the business owners in China.
>
> (W12, technician)

However, this does not mean the author wants to moralise technology workers in the internet industry. In fact, the workers are motivated to tolerate the bitterness of their jobs by both their (perceived) salaries and their professional pride. Because the Chinese government has been heavily investing in the technology industry for pursuing China’s dream, other sectors in the economy are considered to be lagging behind in the economic transition. Technology workers, who are usually specialised in software-related skills and knowledge, believe they cannot find better jobs in other professions. This is particularly the case when the Chinese economy has been slowing down since the outbreak of COVID-19. Researchers also highlight the considerable cost of job search for workers, such as relocation, waiting around unpaid to be interviewed, etc. On this note, investor V2 shared his view about why people would stay in the internet industry given the unfavourable work conditions.

> The wages in the internet industry are better than in other professions, so people are willing to stay in this field. After all, what is the second-best option? Just like Foxconn's factories, many say the exploitation in Foxconn is so unbearable, but still Foxconn workers want to work for more hours so that they can earn more money. [...] If you are working in this industry, you have no other options. This is the reality.

Moreover, while V2 did not dismiss the fact that the working conditions in China's internet industry are tough, he seemed to see this phenomenon as a virtue for investment, 'because without this hardship and commitment, there is no way a business can survive the fierce competition in China's internet industry'.

Last but not least, while salaries for factory workers are highly standardised (usually the legal minimum wages in the local province), technology worker salaries in China vary dramatically, even for workers in the same position. For instance, Digitech has adopted a productivity-based salary system, where technology workers are compensated according to their evaluation based on the key performance indicator (KPI). The KPI is a set of multiple personal business objectives that Digitech's workers need to achieve each year. Those who outperform their KPI are rewarded with a lucrative bonus and shares on top of their basic salary. Some interviewees (W1 and W14) told the researcher that the top 10% of the workers might have received a bonus of seven times their monthly salary plus other employee benefits. This performance-related pay system is designed to attract and retain talent, and to encourage workers' productivity at work, yet there is absence of clear link between pay and productivity (see Edwards, 2007). A separate argument presents itself: highly individualized salaries and benefits might reduce the sense of fellow feeling among workers. Such workers might be less inclined to collective action. This idea deserves greater attention at a later time.

Conclusion

In conclusion, this study has provided an empirical account of the exploitative management practices in the internet industry and argued that this should be seen as the indirect consequence of the government's ambition in pursuing China's technology dream. It also argued that the pluralist ideal of industrial relations is not directly applicable to the authoritative regime, which both the state and employers have strong ambition and can put their common interests before workers, for example, by exploiting productivity from them for profit, taxation, and China's technology dream.

This research re-examined the role of the state by studying how technology workers experience and interpret government's policy and argued that the state remains a significant factor in shaping industrial relations. In 2021, commentators observed that the Chinese central government was increasingly tightening their control over the domestic internet business. For instance, Alibaba was fined 18 billion CNY (2.75 billion USD) for its 'anti-monopoly violations', and the food delivery platform Meituan received a penalty of 3.4 billion CNY (0.53 billion USD) for its market abuse. The impact these measures will bring to industrial relations in the internet industry is uncertain and surely worthy of future research.

This article, moreover, should not be read merely as an intellectual critique of Chinese authorities. Indeed, the key message of this paper is that policymakers should recognise their power and responsibility for improving the work conditions of people, and labour unrest can only be resolved by solving the root causes of problems – in this case, relaxing the competition in the internet industry, enforcing labour policy, and providing more social/digital space for labour affair discussion. While China has become one of the most powerful players in internet technology development, the researcher believes more policy efforts could be made to ensure the benefits of technology are used to improve the job quality and well-being of Chinese people.

Finally, to some commentators (Lin, 2020), the anti-996 campaign blazed a new path for labour activism in China and the world. The decentralised model of campaign, together with the sophisticated use of the internet had successfully mobilised workers across different workplaces, aroused public attention and received support from overseas. On top of these, this campaign is important as it promotes the idea of labour rights in China. Past research shows that labour activism in China was mostly related to the protection of contractual rights, usually when employers failed to fulfil their responsibility as written in their contract (see China Labour Bulletin, 2020). In the discussion of the 996 scheduling, however, the idea of labour rights is seen as human rights by workers and has led to, for example, the demand for information freedom from the government, and the many discussions of decent workplaces and dignity at work. Despite the fact that the state has blocked the campaign, this event should mark a milestone for the road to the construction of labour rights in China.

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Chapter 3 Digital Taylorism in China's e-commerce industry: A case study of internet professionals

Abstract

This article documents the working conditions and experiences of tech professionals at a leading Chinese e-commerce firm. Using intensive qualitative research methods, the author finds that digital management of tech professionals has accompanied and perhaps explains some of the Chinese internet industry's much-heralded increases in efficiency and productivity. This management form can be understood as digital Taylorism, which has similar pathologies to the original Taylorism: a dehumanising effect on the workplace, increased work intensity, a higher income but proportionately lower share of the gains from increased productivity, and intensified competition among workers. It is hoped that this study will open up new avenues for evidence-based discussion about the future of work and the ethics of algorithm use in the workplace.

Keywords

Chinese technology worker, digital Taylorism, digital technologies, knowledge work

The introduction of digital management technologies in the workplace, such as business algorithms and sophisticated communications software, has contributed to the development of new business models, generated new kinds of interactions and relationships in the workplace, and led to shifts in the balance of power and control between capital and labour, all of which have dramatically changed the work process and therefore the workplace experience. While the effects of algorithmic management on casual workers have received much scholarly attention (e.g. Rosenblat and Stark, 2016; Veen et al., 2020; Wood et al., 2019), other types of digital management technologies and the consequences of their introduction on the workplace, especially for professionals in conventional employment settings, remain largely neglected by scholars.

When discussing the future of work, aside from some statistical predictions and theoretical discussions (e.g. Boyd and Holton, 2017; Pettersen, 2019; Wajcman, 2017), relatively little scholarly work has examined the implications of digital management technologies in shaping the conditions and experiences of work, and most of the exceptions have focused on countries in the global north, including several case studies pertaining to Amazon (Altenried, 2020; Delfanti and Frey, 2021; Harney and Dundon, 2020; Newlands and Lutz, 2020); the experiences of workers in the global south continue to be insufficiently researched. To help rectify this imbalance, the research presented in this article was undertaken using a qualitative approach based on in-depth interviews and observation in order to build a case study of one of Amazon's Chinese counterparts, referred to here by the pseudonym 'DigiBuy'.[1] In particular, it hopes to contribute to the contemporary debates around how China's white-collar workers make sense of digital management technologies that are applied to them, by looking at how the way they work and their sense of satisfaction have changed as management intrusions have intensified. To the author's knowledge, this article is the first to apply the underutilised concept of Taylorism (1997 [1911]) to examine how management changes have affected Chinese workers' experience in the workplace.

This article documents in great detail the effects of digital management technologies as implemented within an organisational setting that is believed to be similar to that of the entire Chinese internet industry. Precisely, this article aims to show how digital Taylorism in the form of algorithmic employee management software emerged and came to be applied to Chinese tech professionals, and its impact on issues such as pay and human relations. The article also sheds light on the difficulties faced by Chinese tech professionals today as they

seek to exercise their individual and collective agency. 'Digital Taylorism', according to Altenried (2020: 146), is the managerial practice of 'how digital technologies allow for new modes of standardisation, decomposition, quantification and surveillance of labour'. Quite often, these take place 'through forms of (semi-)automated management, cooperation and control'. In DigiBuy, the employee management software contains a set of algorithms to calculate a worker's business objectives and evaluate one's performance. At the same time, through the use of internal communication soft- ware, workers are constantly connected and supervised by their managers. This article argues that such digital management in knowledge work is increasingly complex and invasive. These intrusive controls extend beyond productivity in the workplace to influence worker behaviour during ostensibly free and absolutely unpaid time.

This article is structured as follows. First, the author reviews recent debates on the revitalisation of Taylorist principles in order to identify concepts developed in Western contexts that might be useful to understanding the Chinese tech work environment, as well as previous works in studying the digital labour regime in China. Second, he dis- cusses the research methodologies employed in this study and issues pertaining to research ethics. Third, the author presents the tech work in context, and a further analysis pertaining to how digital management 'dehumanises the workplace' (*The Economist*, 2015) and impacts both the manner in which work is done and how workers feel about it. Finally, he discusses the research findings in relation to digital Taylorism in the inter- net industry and the future of work.

Literature review: Re-examining digital Taylorism in China's tech work

The emergence of digital Taylorism in professional work

Taylorism originally referred to a set of managerial principles from the Fordist era that were intended to increase the productivity of manual labour on an assembly line through various measures of rationalisation, standardisation, decomposition and deskilling of labour processes (Taylor, 1997 [1911]; see also Braverman, 1974). While the globalisation of capital accumulation and transnational production has incentivised the use of flexible production strategies, a number of researchers (e.g. Crowley et al., 2010) insist that Taylorist management principles continue to be relevant for blue-collar workers in the post-Fordist

economy and, potentially, even beyond the manufacturing sector. The ideas discussed by these researchers set the conceptual foundation of this article.

For instance, Brown et al. (2011: 74) observe that knowledge work has been 'industrialised' in professions such as consultancy, retail, health and finance. Workers in these sectors are subjected to digital Taylorism, in that tasks are increasingly performed and managed by software packages, instead of being taken care of by employees utilising their expertise and professional judgement. At the centre of this digital Taylorism is the datafication of work (Delfanti and Frey, 2021) and the intensification of performance control (Gautié et al., 2020).

Taylorist management principles aim to increase productivity by extracting information from workers in order to allow managers to control workflows and intensify production (Taylor, 1997 [1911]). Scholars argue that algorithms have come to 'assume managerial functions', with tasks being 'assigned, optimised, and evaluated through algorithms' in the workplace today (Lee et al., 2015: 1603). According to Mateescu and Nguyen (2019: 1), the use of algorithms for managerial purposes requires 'relying on data collection and surveillance of workers to enable automated or semi-automated decision-making'. One example of these algorithms is the sophisticated scheduling software used for workforce management in retail and service industries (see Delfanti and Frey, 2021).

Moreover, the installation of digital management technologies on workers' laptops and smartphones facilitates both production by workers and supervision by managers, who now are constantly connected. This 'time–space' compression has created time pressure at work, speeding up the pace of everyday life and eroding the physical and temporal boundaries that separated work from home and leisure (Wajcman, 2015, 2019).

Indeed, since the introduction of smartphones in the workplace, researchers (e.g. Duxbury et al., 2014) have identified some key themes when studying the impact of these sophisticated communication technologies on work practices, such as the extension of work and the increase of overall working time. Scholars also argue that by allowing managers to contact their workers at all hours through emails or instant messaging, the communication technologies let work bleed into non-working times and places, thus causing 'work extensification', especially for professionals (Moen et al., 2013: 84). What seems to be missing in the discussion, however, is how Chinese professionals experience these

technological impacts, given that management culture and work ethics in China differ from their Western counterparts.

While these new digital technologies allow for the rise of the classical elements of Taylorism mentioned above, researchers add that the introduction of such digital management is not a simple return of Taylorism, for the changes brought about in the workplace often occur in more novel and invasive ways. Recent studies on the e-commerce giant Amazon have revealed how these technologies have intensified work at the company: they have increased automation, tightened performance measurements, and most importantly intensified control over workers through the datafication of workers (see e.g., the Bloomberg news report [Mihm, 2018]). For instance, Delfanti and Frey (2021: 659) argue that 'Amazon strives to soak up value from workers through a sophisticated form of digital Taylorism based on the nuanced codification, capture, and datafication of work'. While in traditional factory settings, management extracts information from workers in order to control workflows and intensify production, this process is now at least partially automated, as software systems capture workers' activities, datafy and analyse them, and use the results to improve downstream labour processes in the workplace.

In addition, Altenried (2020) argues that tech work on Amazon's crowdwork platforms is radically decomposed, that is, huge data sets are decomposed into microtasks, the majority of which are very small jobs that can be completed in minutes or even seconds. These platforms use complex algorithms to evaluate the quality of a given worker; others let customers decide whether a task is done successfully and rate workers accordingly. These evaluation systems lead to situations in which many workers feel that neither the quality nor the volume of their work is captured by these evaluation tools. As a result, researchers conclude that a result of using digital technologies for managing workers and measuring their performance is that workers are manipulated through the digital platforms; many workplaces have been dehumanised to a considerable extent (see Spencer, 2017).

As shall be seen, similar dynamics exist in the Chinese internet industry, in which workers' performance and activities are increasingly datafied for management purposes. The author sought to compare findings from the US with workplace experiences in China, especially where new digital technologies are being used for communication, worker evaluation and management purposes. While previous commentators have focused on

changes to labour control and labour processes brought about by digital Taylorism, there is a lack of discussion of other aspects of employment relations such as pay, working hours and workplace relations. This study tries to fill this research gap by studying how digital Taylorism is applied to tech professionals in China, as well as the effects of these applications in conventional employment settings.

The digital labour regime in China

China is now a global leader in some internet sectors, including e-commerce, digital payment and cloud computing. According to a working paper by the International Monetary Fund (2019), the rapid growth of China's e-commerce sector and the Chinese platform economy have become key drivers for job creation. For instance, tech giant Alibaba has created over 30 million jobs in the e-commerce sector over the past decade. In terms of gender and age composition, the country's digital labour regime is dominated by male workers aged under 35. While workers in small- and medium-size tech companies tend to be less educated and from less-privileged backgrounds (Sun and Magasic, 2016), most workers at internet conglomerates such as Baidu, Alibaba and Tencent (the 'Chinese BAT') have received tertiary education overseas or at prestigious universities in China, and it is not uncommon to find workers with postgraduate qualifications or even a PhD (Zhang, 2018).

Although studies indicate that workers in the internet industry have contributed significantly to the rapid economic expansion of China, neither the labour process involved in their work nor their working conditions have been the object of much academic research. This may be due to the secretive nature of these companies and their requirement, placed on all employees, that all work-related matters shall be treated confidentially. This preference may have intensified after the '996' controversy, during which an information campaign led the general public and even the Chinese government to criticise the industry standard of 12-hour days, six days per week (Liu, 2022). Other factors include the Chinese government's ban on genuinely independent unionism and on labour-related non-government organisations engaging with workers in the internet industry. The overall result has been that labour issues in China are rarely discussed publicly, either online or through traditional media outlets and platforms.

According to official statistics (China Statistical Yearbook, 2020), jobs in the internet industry come with a higher salary on average than jobs in other professions in China.

However, many scholars are concerned about the actual experience of work in the industry, and they often point out the unfair and exploitative nature of these jobs. For example, based on numerous interviews with workers, Xia Bingqing (2018) has argued that in China, workers in the internet industry (especially graduates) are subsumed into capital structures that focus on financing and acquisitions, and disregard human capital. Sun and Magasic's 2016 study of programmers (*manong*) in small tech companies in Shenzhen shows that they often work overtime and in highly stressful environments.

More recently, Li (2019) has argued that resentment and disappointment have accumulated among Chinese technology workers since 2018, due to industrial restructuring in China's internet industry. According to Li, these workers had been motivated by the 'big firm dream', believing that by 'paying their dues' with overtime work as young employees, they would secure good salaries and opportunities to advance their careers within a single firm. The ease with which these companies fired workers at the first moment of economic hardship, however, led these workers to feel that they had been 'betrayed'.

While these studies provide a better understanding of the situation and experiences of Chinese tech professionals, some important questions related to the digital labour regime in China remain untouched. In this connection, the author suggests that China's digital labour regime can be better understood by means of an analysis of how tech professionals are subjected to algorithmic control and its impact on employment relations, as well as an analysis of the difficulties which these workers face when resisting such algorithmic control.

While the research findings presented here are by no means representative of the experiences of every tech professional in China, they nevertheless reveal some of the structural features of digital management as commonly obtaining to sizeable internet companies in China. In doing so, they also give readers a clearer picture of the wider situation pertaining to employment relations across the industry.

Research context and methods

This study is part of the doctoral research project the author conducted from 2018 to 2021. Nearly 60 interviews were conducted overall, including 34 in-depth semi-structured interviews with particular relevance for this article. The interviewee list includes workers at DigiBuy, technology investors, tech journalists and others with both an interest in and

knowledge of this industry. Each interview lasted from around 30 to 90 minutes. The conversations were audio-recorded and later transcribed, codified, and translated by the author according to, e.g., working hours, work intensity and sense of autonomy. The key topics discussed included interviewees' daily work routine, how digital technologies are employed in the workplace, assessments of the ability of such technologies to assist them in completing their everyday tasks and communicating with colleagues, how they feel about the technologies, their sense of satisfaction and dissatisfaction at work, and so on.

In addition to the interviews, this article draws on about three months of participant observation in China from June 2020 to September 2020, including two months in the city of Hangzhou. Observation sites included offices, coffee shops, a dining area, meeting rooms and leisure facilities inside the DigiBuy campus. Before fieldwork commenced, this research project underwent a rigorous ethical review by the ethics committee of the Department of Sociology, University of Cambridge. All interviewees in this research project were informed about the research purpose, and pseudonyms are used throughout the article in order to protect the identity of all participants.

Beyond visiting and investigating the physical spaces in which DigiBuy work is done, the author also analysed posts on DigiBuy's online forum for employees and on the social media platform 'WeChat', in order to study the most prominent issues faced by workers in the company. These platforms are often used by DigiBuy's workers to complain about their jobs, discuss business strategies, share important events in their personal lives, organise social events, and look for romantic partners. Given that the author had limited opportunities for interpersonal contact with workers in this organisation, communication on these platforms enabled him to enrich his understanding of their experiences in working for DigiBuy and provided opportunities to develop his network of informants and potential interviewees.

For purposes of analysis, the company can be divided into three major departments according to their nature of business: the computing department (responsible for programming and other technical tasks), the product department (which formulates business strategies and designs the features of the e-commerce platform) and the business operations department (which handles communications with the platform's sellers and buyers). The CEO directly supervises each department's senior officer (e.g. Chief Computing Officer),

who is in charge of multiple working groups, each of which is divided into teams. DigiBuy employs over 10,000 full-time workers.

Tech work in context

The internet industry encompasses highly technical professions such as programming and more generalised professions such as human resources or hardware maintenance. DigiBuy's recruitment website indicates that programmers without a degree from a renowned university in China need not apply, and more than half of the interviewed programmers held a master's degree in computer science or information technology and had years of experience in computer coding. As DigiBuy employees, their tasks were to provide technical solutions according to requests from the product or business operations departments.

The author observed that a DigiBuy programmer's typical day starts with a group meeting at 10:00 a.m. to set the tasks and schedule for the day and discuss the methods for handling these tasks. The meetings usually last from 15 to 30 minutes, after which employees begin work at their own work station. The author observed much communication between colleagues on 'DigiTalk', the internal corporate communication software workers are required to install on their personal smartphones and computers. The author also observed that short, ad hoc in-person meetings with people from other groups or departments occur occasionally. At noon, everyone takes their lunch and afternoon break. At 2:00 p.m., employees return to their work stations and continue working, usually without breaks, until 9:00 or 10:00 p.m.

Because of the long working hours, all interviewed workers embraced the idea that it is important to improve their efficiency and productivity at work by offloading tasks to software packages that are regularly installed on their workstations. At first glance, employing technology in this way can save the workers a lot of time and energy. 'Automation', Chris said, 'can definitely increase our efficiency. They [new digital technologies] can help free me from having to do repetitive tasks and enable me to do things that are more meaningful.'

Even if workers are able to carry out their tasks more efficiently due to the implementation of these technologies in the workplace, ironically, this does not guarantee that workers can actually reduce the *overall amount* of work they are expected to do, or

guarantee that their workday is any less stressful. Quite the opposite, as the interviewees told me, their jobs remain very demanding. According to Fiona, a business analyst in the product department, because managers can access workers' schedules through internal employee management software, they can see exactly how workers allocate time for their tasks and at what times they are free. Fiona's managers can easily see what task she is working on and when she may have free time. This enables them to fill her schedule up with more tasks, which has a demoralising effect because, according to Fiona, 'although the technologies can help you complete your tasks more quickly, there will always be another assignment waiting for you'.

In addition, the interviewees reported that as the efficiency and productivity of each employee increase along with the automation of tasks by these technologies, managers tend to reduce the size of a working team in order to lower costs and further increase their productivity. Sophie, a seasoned DigiBuy project manager, expressed frustration with these management practices, saying:

> I used to work in a team with four or five colleagues. Now, I am working in a much smaller team. . . . The division of labour is more precise, and each of us is more capable of completing the work than before, but at the same time, everyone has to work for longer.

It is ironic that while digital technologies allow workers at DigiBuy to complete their tasks at a faster pace, more work is assigned to them by their managers through the employee management software, which leads to longer working hours in reality.

Pay, performance measurement and competition

The author has presented the paradox involved in workers' initial support of digital technologies being used at work in their hope of reducing their working hours. However, there is another important reason for workers to pursue greater efficiency at DigiBuy. This is the pressure which is placed upon them by the Key Performance Indicator (KPI) performance evaluation system. KPI is a set of multiple personal business objectives in the employee management software which, formally, are determined by the workers and their direct manager(s) each year.

For example, a programmer might have a KPI objective of finishing three software update projects in the first quarter of a year; a marketing executive might commit himself to increasing a certain app's number of users in a particular province in China. However, an important fact pertaining to the KPI that can be inferred from the testimonies of interviewees is that power asymmetries obtain as workers try to negotiate their individual KPIs with their managers. In other words, the KPI *imposes* a target that a worker must achieve. As Lee, who is a marketing assistant in the product department, related:

The ultimate KPI of the company [DigiBuy] was set by the CEO. An example could be that we have to double our transaction volume in sportswear by the end of the next year. By using a set of complicated algorithms, business analysts will break down the sales target for different departments, then into different working groups and teams, and as such, you will have your individual sales target (KPI) for this year.

The successful accomplishment of a KPI directly affects the bonus and benefits a worker receives, as well as one's promotion opportunities in the future. These bonus and promotion opportunities will only go to some of the top achievers, while those who fail to meet their KPI for two successive years will usually be dismissed. This echoes the Taylorist principles (Taylor, 1997 [1911]: Ch. 1) in managing manual workers that one who works with higher efficiency than one's peers should receive higher wages than the others. At the minimum, the KPI is the official system to evaluate a worker's contribution to the company, and therefore the key rationale for decisions related to promotion or firing. But in reality, the dynamic between algorithms, evaluations and rewards is more complicated.

In DigiBuy, these personalised business objectives, according to the interviewees, are usually demanding and difficult to achieve given the limited number of people or resources available for individuals working alone or even as part of a wider group in a given department. 'There is a saying in my team', according to business executive Peter, 'is that "the best performance today is the minimum requirement of tomorrow". Your KPI will be set on top of what you have accomplished, regardless of how the business environment has changed.'

In order to encourage workers to achieve their goals, DigiBuy has a fruitful reward system for those who exceed their KPI target. Some workers are given bonuses of seven times their monthly salary, company shares and more if they perform outstandingly over the

course of a year. However, not everyone in the team enjoys such benefits after a year of hard work. According to Catherine, who works as an executive in the business department,

> The bonus system is called '3-6-1'. . . . Say that there are ten people in your team. There are always three winners who can get the most out of it, six who will get an average reward, be on average, and one who loses out. . . . Those three winners who are in band A might get seven to eight months' salary as a bonus. I was in band B and got six months' salary as a bonus last year. The one in band C can only get one to two months. What you get will also partly determine whether you will be offered a promotion. As a result, there is a strong culture of competition at DigiBuy: within each department, among teams and even within small working groups.

It is usually the case that workers will start searching for jobs in other tech companies after one to two years in band C as they are expected to be lay-off for their underperformance in the company. Financial rewards seem to be the primary motivation of their job commitment, in my interviewees' perspective (Kelvin), and they believe that DigiBuy is one of the top payers in China's tech industry. While some DigiBuy workers might disclose their individual KPI with their close friends or teammates (as some interviewees believe that being open with their teammates improves team cohesion), most of the workers I interviewed do not know anyone else's KPI. Also, because of the '3-6-1' reward system, there is a tremendous uncertainty among workers about whether all their hard work will or will not be rewarded, even if they attain the goals they agreed to pursue.

Among many other things, this fierce competition for rewards among the workers at DigiBuy takes the form of wilful prolongation of working hours. Because of the clock-in function in the employee management software, managers can easily see which teams or individuals are working overtime. According to Fiona,

> There are five teams in our group. This month, our manager plotted a line graph, showing that my team did the least amount of overtime last month – half an hour per person per day on average – with other teams working overtime for two to three hours. It was obvious that our team was the worst [in terms of overtime working]. We asked him how he came up with the data. It turned out that he got it from the clock-in function, which is built into the employee management software.

It was not surprising to hear from interviewees that the long working hours had led them to experience burnout and lose any sense of the benefits of their job and the virtues of work in general. Most importantly, their overtime work is unpaid, a condition that is considered absolutely normal in China's internet industry. This is also why workers see their end-of-year bonus as so important: band A workers are more than compensated for their overtime 'investment'; band C workers are not.

Stephen, who is a consumer analyst in the product department, added, 'I think my team has longer working hours than the others. . . . Sometimes I have to work six days per week, or six days every other week. I think this is inhuman. We are just a *gongju ren* [a person who is just a tool or mere instrument].'

The term *gongju ren* was frequently mentioned during interviews with DigiBuy employees, and also on DigiBuy's internal forums. The term can be literally translated into 'a tool person' in English, but it denotes a person being manipulated as a tool at work, such that, as mentioned above, they are someone who is viewed as a mere tool or instrument. Unlike the word *manong* (programmer; literally, 'code farmer') which was brought to the attention of English-speaking scholars by Sun and Magasic (2016), *gongju ren* not only refers to low-level programmers in small tech firms, but also encompasses the wider population of technology workers who are relatively well-educated, highly-paid, and serve in a sizeable tech companies like DigiBuy. However, this sense of being manipulated and being treated as a mere instrument is not unique to programmers. As in the case of Stephen and other interviewees in this study, this feeling of being undervalued at work is common in workplaces in companies like DigiBuy, and is experienced by programmers and support workers alike.

Managerial control, job insecurity, and the ability to resist

Unlike traditional Taylorist management of manual workers, where managers tell factory workers exactly what to do and how much time they can spend on each task, a defining nature of tech work (and knowledge work in general) is that managers define and control outcomes, but not work processes (Teipen, 2008: 312). Within DigiBuy, the author observed that the continuous pursuit of KPI has led to the development of a result-oriented organisational culture that in turn leads some managers to disregard when, where and how workers do their job, as long as managers can see that 'progress' is being made. On the face

of it, this appears to be non-Taylorist or even anti-Taylorist, but it turns out to be highly Taylorist in practice because managers are constantly checking on their workers via DigiTalk. Although the implementation of digital communication software at work is often associated with flexible working hours and taking work home (Felstead et al., 2005), this benefit does not accrue at DigiBuy.

DigiTalk, an important element of DigiBuy's employee management software, is used for internal communication. It is linked to every employee's personal mobile phone from the day they start working for the company. One feature of Chinese work culture is that workers are expected to respond to the message and work on the given task immediately. DigiTalk builds on this social expectation: it can detect when a message has been read. Once a message is sent by the sender (who is usually the manager), it will repeatedly send notifications to the receiver to remind them to read the message. It also has an auto- dialling function by which the software will keep calling the receiver until they read the message. While this software claims to facilitate effective communication, the functions on DigiTalk are an uncompromising way for managers to add stress to their already over- worked employees' lives. From the managers' perspective, of course, the software ensures that lines of communication between management and employee remain open at all times and that work is completed on a timely basis, which, in turn, maintains the high efficiency of business operations at DigiBuy.

On several occasions while the author was conducting interviews with DigiBuy workers (at times when they were off duty and, formally, not expected to be working), interviewees had to pause our conversations in order to respond to their managers on DigiTalk. This happened one evening at 10:00 p.m., during a late dinner, and also on a 'non-working' Saturday night. There have been more extreme cases. Chris related that once, when he went to his colleague's wedding, the bridegroom (a DigiBuy employee) was asked to revise a business proposal in the middle of the ceremony. Due to the 'always ready' work mentality at DigiBuy, the bridegroom felt compelled to fulfil his manager's request before they continued with the ceremony. This sense of being constantly managed by their managers by means of such applications and software led to the interviewees to sarcastically refer to themselves as the 'working ladies on a production line' (Luke, communication officer), and 'a slave of DigiBuy' (Catherine), and, most commonly among the interviewees, *gongju ren*.

In addition, the author noticed that both this extreme sense of duty to the company and the aggressive pursuit of KPI on the part of workers are driven by a sense of job insecurity. Workers in DigiBuy feel that their jobs are always under threat because the digital management prevalent at the company means that employees are compared almost solely on their performance statistics, while other aspects in employment relations are neglected. Workers become replaceable if they fail to achieve their business objectives. Other than productivity, their unique skills, personal relations and loyalty to the company are considered less important and they are reduced to a mere set of data items in the algorithms used for evaluation. After all, under the regime of intense competition which was noted earlier, what matters for managers is the set of measurable statistics pertaining to worker performance, such as working hours, sales volume and KPIs. As such, rewards and opportunities for promotion go to those who achieve their individual business objectives. Workers are constantly anxious about whether they will be replaced by someone who, viewed solely in terms of statistics, is willing to work longer hours and performing better than them (including their colleagues and even newcomers to the industry).

Product manager Roger related something that touches exactly on this sense of precariousness: when the author asked him whether or not he thinks his job will be replaced by AI in the future, he said 'perhaps I will lose my job before the day that such technology is invented. There is a sea of people who want to enter this company, the young ones. . . . They are cheap, they are willing to work overtime, and they are easy to manage.'

Because of this sense of job insecurity, it is difficult for any individual to challenge the use of such digital technologies, not to mention the hierarchical structure they solidify. Past studies (e.g. He, 2021) investigating industrial citizenship in China suggest that the labour shortage of (migrant) workers and their great turnover in the manufacturing industry have given workers more power in negotiating work conditions. In contrast, the internet industry in China is experiencing the exact opposite situation, where the labour abundance in the digital economy has increasingly strengthened the employers' position in the industrial relations system. Every year, there are about 10 million university students graduated in China, who are aspired to seek jobs in the profession that has the highest earning on national average – the tech sector (Jiang, 2022). Industry insiders (Deng and Qu, 2022) also revealed that the economic slowdown in China in recently years also adds another layer of insecurity to technology workers, as Chinese tech companies are cutting large numbers of jobs as a

cost-saving measures. These conditions have further demoralised the militance of Chinese technology workers due to their unfavourable bargaining position in the labour market.

At the individual level, DigiBuy workers have responded in two ways. First, they have learned some tricks in order to 'beat the system'. For example, many deliberately stay late at work in order to fully utilise the dinner and taxi allowance they receive for doing overtime. Second, they use the internal forum to seek and receive comfort when they feel aggrieved as a worker. That is, it is common for DigiBuy employees to share their feelings (such as being fatigued, unhappy and angry) on the employee online forum, with their colleagues often conveying their solidarity and support. In principle, this forum could be used as a means to coordinate collective action. In reality to date, employees have not shown any serious interest in using the platform in this way.

According to some interviewees, other forms of collective resistance include deliberately slowing down the work of an entire team so that the manager will think that the team is busy, and having unnecessary meetings with other team members so that colleagues can move to a meeting room and enjoy a temporary respite from work. If the team believes that the manager is supervising them in an abusive fashion (for instance, constantly sending them reminders on DigiTalk), teammates might collectively apply to transfer to another team, to signal to the senior management that this particular manager may have some issues with his management style, according to Catherine. While such collective efforts to resist both digital and abusive management styles certainly take place in DigiBuy and similarly-sized Chinese tech companies, it is believed that larger- scale collective efforts such as unionising are impossible, given the current socio-political environment in China. In any event, no interviewee expressed optimism that union activity could improve working conditions, none expressed interest in participating in union activities, and many were unwilling to discuss the subject of collective action because they 'don't want to get involved in politics' (Alex, business executive). This situation is expected to continue unless there are government policy interventions, or if democratic-style management is introduced to the workplace. So far, the government has not indicated any interest in intervening and, given the labour supply and demand condition in this industrial sector, pro-workers management changes are unlikely.

Given all the difficulties faced by workers at DigiBuy, many decide to quit the company and the internet industry permanently. Some interviewees (especially the females)

were of the view that when one reaches about 30 years of age, it is the right time to leave the industry and hopefully regain their life and start a family. Just as technical assistant Lucy mentioned, 'there is a saying in DigiBuy to cheer up your peers: "one day you will earn enough, and the first thing to do when you quit this job is to delete DigiTalk on your smartphone". Otherwise, there is no way out.'

Discussion: Digital Taylorism in the internet industry and the future of professional work

As the findings reveal, while the use of digital technologies can boost efficiency and productivity at work, they also bring other impacts such as increasing work intensity and intensifying competition between workers. In DigiBuy, managers rely heavily on algorithms to evaluate employees' performance. Therefore, data collection and worker surveillance become central to management practices intended to drive workers toward achieving business goals. Thus emerges digital Taylorism, which has been shown to be considerably more invasive, sophisticated, and yet also more rewarding for those who succeed in meeting the business targets. Nevertheless, the findings also show that the use of the communication software DigiTalk has led to worrying encroachments on the personal lives of employees by the company, as well as further prolongations of employee working hours. Such a combination of technological impacts in the workplace should be considered as newly emerging characteristics of digital Taylorism.

However, it must be noted that while much of the discussion in this article has been about how managers control workers through the use of digital management technologies, and consequently demoralise workers in the workplace, it is not the author's intention to demonise DigiBuy's managers. As was observed during the fieldwork, some of them are also victims of extreme scheduling practices and have suffered from the pain and fatigue (physically and mentally) brought by their own long and stressful working hours. The argument here is that digital technologies have significantly influenced the organisational culture and work ethics of DigiBuy, which have themselves emerged as a structural force that puts huge pressure on every worker in the company.

Unfortunately, this work culture remains dominant in China's internet industry today, and Chinese tech gurus still uphold this exploitative management philosophy in their organisations (see e.g., VICE Asia, 2021) because they believe that it can provide the

efficiency boosts that enable their companies to thrive in an extremely competitive business environment. Perhaps unsurprisingly, the experiences of workers considered in this case study mirror those of workers in Silicon Valley, such as the fast pace at work (Wajcman, 2019) and how the advantages of new technologies, including greater efficiency and productivity, become desirable qualities of technology workers (English-Lueck, 2017) who eventually fall victim to the digital technology. In particular, when comparing the technological impacts in DigiBuy with previous research findings from Amazon, two main differences are noticed. First, Amazon has specifically designed environmental and wearable technologies (e.g. sensors, bracelets) in the workplace to check workers' movements and their work rhythms. DigiBuy, in contrast, relies on non-workplace-specific technologies such as personal smartphones and laptops, which make managerial control more invasive in personal life. Second, the algorithms developed by Amazon platform 'Mechanical Turk' allow customers to rate the work done by workers, but this function is not seen in DigiBuy, where work evaluation is solely internal and based on the KPIs. This suggests that, while the experience of factory work under traditional Taylorism is relatively homogeneous (e.g. the feelings of alienation), work under 'digital Taylorism' could be more complicated and diverse, and individual work experiences may vary significantly, due to different technological infrastructure, organisational culture, and more. Future research could look at more organisations to further investigate the differences.

Meanwhile, in discussing the future of work, many scholars (e.g. Brynjolfsson and McAfee, 2014; Ford, 2015) focus on digital technologies because they are primarily concerned about how automation may either threaten white-collar jobs or, conversely, create more jobs by forcing companies to redesign labour processes (Susskind and Susskind, 2017). Others (e.g. Oxford Martin School, 2016) are concerned with macro- level developments in the labour market, such as changes in skills or job categories. Theorists often have an optimistic take on the future of skilled professionals when dis- cussing how they will be impacted by new technologies in the future, with some scholars (e.g. Pettersen, 2019) suggesting that the jobs and tasks undertaken by skilled workers, including those performed by technology workers in this case study, are more 'human' types of work, as they involve cultivating strong interpersonal relationships, the use of imagination, and intuiting possible solutions to problems, rather than the regurgitation of simple items of knowledge. Of particular importance, however, is that the cultivation of inter- personal relationships (either

with colleagues or clients) requires emotional reciprocity and the building of trust; at least for the foreseeable future, AI is incapable of these things (Shestakofsky, 2017).

Even so, the discussion of the findings presented here goes beyond the discussion of such macro-factors, focusing on the subjective experiences of workers to advance our understanding of how digital technologies, and digital management software in particular, impact workers' experiences in conventional employment settings. Having been arrived at by means of a qualitative approach, the research findings presented here demonstrate that business algorithms can have a profound effect on tech-related jobs and the tasks which are involved, especially when they are used to facilitate reward systems.

In the case of DigiBuy, given they have already invested so many hours at work, most workers believe they should follow the instructions from their managers and maximise their personal gain from their labour, even if they are well aware of the negative consequences that such concessions to the digital management may bring. In this connection, some programmers who were interviewed for this research project have already internalised the exploitative nature of their jobs and have come to see it as part and parcel of their occupation and identity as technology workers, with some making remarks such as 'this is the nature of our job in China' (Geoffrey) and 'I accepted it since the day I entered this profession' (Chris). The experiences they related during the interviews highlighted the complexity of the effects of digital management technologies on professionals in the industry, and should serve to motivate researchers to put the subjective experiences of workers at the centre of analysis when studying and theorising about technological development. This is particularly important because many technological impacts in the workplace, as shown in this and previous studies (e.g. Shulzhenko and Holmgren, 2020), are the combination of intended and unintended effects.

Last but not least, there has been a recent focus among scholars on working time in relation to the future of work (e.g. the forthcoming special issue of *Cambridge Journal of Economics*). Some commentators argue that human beings can be liberated from the need to work in a matter of decades due to technological advancements. The proponents of this view believe that the fruit of technological advancement – namely an increase in productivity – can be harvested and shared by the working class and that such a development might lead to a radical reduction of working hours or even a post-work society (e.g. Mason, 2015; Srnicek

and Williams, 2016). According to such theorists, mass job losses due to technological advancements, including in professional sectors, are inevitable and a sign of progress.

However, as the research findings suggest, perhaps it is infeasible to solely rely on technology as the means for bringing about the liberation of work under the current socio-political structure of the economy. Due to the profit-seeking nature of commercial organisations, it might be argued instead that government intervention will be essential to achieve a desirable reduction in working hours in a capitalist society in the long run. Better knowledge of the implementation of new digital technologies in workplaces is certainly needed to inform public policy on these issues.

Conclusions

The purpose of this article was to investigate the impact of the implementation of digital management technologies in DigiBuy, as a case study that can help readers understand the experiences of workers in China's internet industry. In pursuing an in-depth analysis of this case study, this article serves to highlight how Taylorist principles apply to Chinese tech professionals in terms of digital management and its impact on employment relations. The analysis also helps to explain the difficulties which tech professionals face in exercising their individual and collective agency in sizeable tech companies in China.

The author has endeavoured to provide a detailed account of how the pursuit of productivity increases can, in fact, trap workers, leading them to suffer extremely long working hours, even though cutting-edge technologies are used at work. From this perspective, there is little sign of the liberation from work that has accompanied earlier moments of technological development. Rather, new digital technologies, such as algorithmic evaluation and management systems, have served to further strengthen managerial control of workers – from manual workers to professionals – to a degree that is substantially more domineering and invasive than had been afforded by previous technological developments. Given that new digital technologies are being used for an ever-larger variety of commercial purposes, the author set out to detail the dehumanising effects of digital management in professional workplaces, in which workers presumably enjoy more autonomy and flexibility than those in warehousing settings and on production lines. It hopes to open up new opportunities for evidence-based debate on the importance of the policy, regulatory and ethical dimensions of new workplace technologies for the sake of staff well-being. It remains

unclear, however, how different types of human–machine collaboration in different workplaces will affect workers with different demographic backgrounds, such as gender and age. This could be a direction for future research.

Note

1. Pseudonyms for the organisation and participants in the research are used throughout this article for the purpose of protecting their anonymity. The essential narrative truth of what is presented in the article remains preserved.

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Chapter 4 “When nobody listens, go online”: The “807” labour movement against workplace sexism in China’s internet industry

Abstract

An online petition, signed by more than six thousand Chinese technology workers in August 2021, is the latest example of an online labour movement in the authoritarian context of China. Combining interviews and publicly available information, this article provides a descriptive account of an activist movement, explains workers’ demands, and discusses the characteristics of online labour activism. It explores how Chinese technology workers fight collectively against a gender-discriminatory workplace culture as they strive to bring justice to a sexual crime victim without affiliating themselves with official political organizations. The research findings suggest that while rising feminist consciousness has the potential to motivate collective action by workers, such motivation is highly dependent upon individual experiences at work and tends to be event-based and of limited continuity. It argues that rising awareness of women’s rights provides a new kind of legitimacy to labour activism, and a new way to express labour concerns in a context of increased criminalization of labour organizational activities in China today.

Keywords China, digital economy, industrial relations, labour activism, technology worker

1 Introduction

In the wake of the economic transition from manufacturing and service to the digital economy, the internet industry has become a new frontier of labour activism in China. Researchers have demonstrated that the working day in the internet industry is stressful, highly exploitative, and extremely long. Studies (Sun and Magasic, 2016; Xia and Kennedy, 2014) show that the working conditions in China's tech and Internet industry are poor, often with long working hours in highly stressful environments. Also, Liu (2022a) documents the intense competition in China's internet industry that has led to prolonged working hours (widely known as "996" scheduling), as well as the resulting worker burnout.

This article looks at workplace sexism in China's internet industry by examining the "807" labour movement. In August 2021, as a protest against a workplace culture that discriminates against women, over 6000 technology workers signed an online petition demanding that their employer, Alibaba, investigate into what they believed was a sexual crime in the workplace, as well as implement several institutional and policy changes intended to promote a better work environment. This case warrants academic attention for two reasons. First, Alibaba is the largest tech enterprise in China, with more than 200,000 workers. Therefore, worker organisation in Alibaba can have a significant impact on the work ethics and workplace culture throughout China's internet industry. Second, researchers note that the current leadership of China's government has employed a significantly more coercive and repressive approach to governing labour activism (Fuchs et al., 2019). This includes a crackdown on labour NGOs and mass arrests of labour activists (Franceschini and Lin, 2020), which have heightened the risks associated with and have a demoralizing effect on labour activism in China today. Hence, the willingness of so many people to publicly support the workers' demands is worthy of sustained scholarly attention.

Past case studies of collective actions by workers in China focus mainly on rural migrant workers in the manufacturing industry, such as the Honda workers' strike in 2010 (Chan and Hui, 2012; Gray and Jang, 2014), the strike against shoemaker Yue Yuen in 2015 (Schmalz et al., 2017), and the Shenzhen Jasic struggle in 2019 (Pun, 2021). Meanwhile, despite being featured in some journalistic reports (Cadell, 2019; Meng, 2021), the importance of collective actions by more privileged and better-paid Chinese technology workers has been overlooked. Moreover, existing studies rarely place workers' online

activities at the centre of their analyses. The implicit assumption seems to be that, even today, workplace actions like strikes are the main source of pressure on employers in labour disputes. This article addresses this poverty of knowledge by asking the following two research questions:

> (1) What is the state of gender relations in the Chinese internet industry, particularly in the tech enterprise Alibaba, and how did such relations motivate the 807 online petition?
>
> (2) How and to what extent the 807 movement inform our understanding of online labour activism in China, including the government's responses to digital activism more generally?

This article draws on data collected from online sources and semi-structured interviews during a broader research project (2018–2021) that examined the industrial relations of China's internet industry. It argues that raising consciousness about women's rights provides new legitimacy to workers' collective action. The 807 movement is an excellent case for understanding sexism as it exists in China's tech workplaces, including the role of gender relations in motivating workers to advance their interests without institutional protection from the All China Women's Federation (ACWF) or the All-China Federation of Trade Unions (ACFTU).

This article begins with a review of two sets of scholarly literature: the literature on women's empowerment, emphasising research on Chinese women in the labour market, and the literature on online labour activism in China. Next, methodological issues are discussed and then applied to a presentation of the 807 movement and its associated worker demands. Finally, the characteristics and dilemmas of online labour activism in China are assessed. This article contributes to a better understanding of the tangled and complicated relationship between the labour and feminist movements in China's Internet industry, illustrating their motivations and challenges, strategies adopted and responses of state actors.

2 Research background and literature review

2.1 Women's empowerment in digital China

Following China's economic transformation into a digital economy over the last two decades, more women are entering the digital workforce, taking roles such as online content producers, software developers, and web designers (see Tech Node, 2019). It is estimated that in 2019, 20 million people worked in the Internet industry in China. As the internet industry continues to expand, it provides more career opportunities for women, including managerial positions, and their contributions are acknowledged in society. For instance, the founder of Alibaba, Jack Ma, frequently stresses the importance of women in the company, noting that one-third of Alibaba's high-level managers are women (Human Rights Watch, 2018, p: 37). A study by the Silicon Valley Bank (Lacy, 2017) revealed that in nearly 80% of China's tech companies, at least one senior management position is filled by a woman; this is significantly higher than in the UK (53%) or the US (54%). Compared to jobs in other industries, digital economy jobs require more technological skill and a higher general education; they also provide more financial rewards to the Chinese women who are hired.

One result of the expansion of female professionals is that, nowadays, more Chinese women are socially and financially independent, which enables them to ignore traditionally restrictive cultural norms. For instance, Wu and Dong (2019) detail how, by being hardworking and financially self-sufficient, some Chinese women are successfully breaking through the prevalent marriage norms and redefining singlehood in China. Tan et al. (2021) find that more middle-class Chinese women in cities are keeping pets as companions and use domestic animals to demonstrate their womanhood, instead of getting married and starting a family the traditional way. Others (Liu, 2014: 21) find that Chinese women today emphasize "self-worth, self-reliance, and individual autonomy", instead of devoting themselves to family or childcare; they believe they should be "the master of their life", free from the control of others and even gaining the capacity to 'training' their partners (Peng, 2019: 115).

All of these research findings illustrate that Chinese women see traditional gender norms as less relevant to them. They are becoming more conscious of their autonomy, financial capability, worthiness and freedom, all of which combine into a rising awareness of women's rights in China today. Consequentially, Chinese women are more eager to express their voices, advocate for their rights and create social change, particularly on social media platforms (e.g., Han, 2018; Mao, 2020). The women's liberation movement and institutions associated with it had been initiated by the state and often were connected to the official narrative of "women's emancipation". Chinese women today, however, prefer to promote

their own rights themselves, rather than working through official institutions (Wang, 2018; see also; Zhang, 2015). They do not locate themselves in relation to the communist past, and some even doubt the ability of the official institutions to represent their interests. In addition, the digital space was catapulted into prominence when the global #MeToo campaign reached China in 2017 (Lin and Yang, 2019). Since then, despite potential backlashes, ever more Chinese women have begun to take an active role in defending their identity and their rights, including gender inequalities and sexual harassment in the workplace. The '807' movement, organized in the workplace, can be seen as the latest example of activism in this new wave of feminist movement.

2.2 Chinese women in the labour market

The last two decades of studies on Chinese women in the labour market have been dominated by investigations of rural migrant workers, because they are seen as the most precarious workforce in China (e.g., Chun and Cranfod, 2018; Ip, 2017; Liao, 2015; Pun, 2005; Yuan, 2021). Due to their generally low education, limited skill set, and low social mobility, many migrants fill jobs in the manufacturing and service sectors as, for example, production line workers, dry nurses, or beauty therapists at beauty salons. Their dissatisfaction with their unfavourable working conditions has caused a wave of workers organization and protest movements in China, especially since 2010, and these events have occupied centre stage for those who study labour activism (e.g., Chan and Hui, 2012; Gray and Jang, 2014; Schmalz et al., 2017).

Despite the state's many efforts to improve the employment conditions of women (e.g., the Protection of Rights and Interests of Women in 1992 and the Special Rules on the Labor Protection of Female Employees in 2012), researchers have found that discriminatory practices against women remain in recruitment, job allocation, promotion, redundancy and retirement management and other areas (e.g., Cooke, 2003; Cooke, 2010; Sincoff et al., 2009). Moreover, some employers in China require women to undergo pregnancy tests or adhere to stringent conditions regarding plans for marriage and pregnancy, and often find ways to coerce the resignations of pregnant workers (China Labor Bulletin, 2020). Others (He and Wu, 2018; Wu and Dong, 2019) document wide and still-expanding gender gaps in labor participation, unemployment, and income, especially in China's urban areas.

While academic interest in female workers in the information technology (IT) industry in Western countries and in India has been on the upswing in recent years (e.g., Castell and Skardzius, 2019; Dwivedi and Mukherjee, 2021; Richterich, 2020), Chinese female technology workers have received relatively little attention. As a group, China's technology workers are more educated, well-paid, and far more privileged than most people in the labour market, but these characteristics do not dismiss the fact that gender discrimination and sexism exist against women in China's tech sector.

Cadell and Jourdan (2018) document the extent of workplace sexism in China's major tech companies. Examples include the Chinese e-commerce firm JD.com, which has organized men-only staff social events; a tech giant Tencent's scandal involving a staff event that featured a game in which female employees, on their knees, unscrewed bottles caps held between the legs of male colleagues; and more generally the long-lasting gender stereotypes and pay inequality in these companies. In 2018, Human Rights Watch revealed that tech giant Alibaba's recruitment practices were highly discriminatory against women and that female employees often were sexually objectified for recruitment purposes. For example, several recruitment ads on Alibaba's website stated a preference or requirement for male candidates, and one job ad that stated a preference for female candidates added that they should "possess fine personal image and qualities" (p.38). Some ads even used the physical attributes of female employees to attract male applicants and described the female employees as "late night welfare" (p.86). Another ad highlighted in the report said the female candidate should be "impressive enough to computer programmers" and that "physical characteristics like those of popular female Japanese adult film star Sola Aoi could help the applicant succeed" (p.38).

While Alibaba claims that these ads are attempts at humorous marketing, they are a clear violation of laws intended to protect women. For instance, Chapter IV of the Protection of Rights and Interests of Women states, "[t]he State guarantees that women enjoy equal rights, with men, to work and to social security" (Article 22, see China Laws Portal, 2020). However, commentators including the China Labor Bulletin (2021) argue that these policies are poorly enforced, and the All-China Federation of Trade Unions (ACFTU)—the only legitimate labour organization in China—has long been under fire for its ineffectiveness in defending the interests of women workers. For example, Taylor and Li (2007) criticize the ACFTU for actions that effectively serve the interests of the state rather than workers it is

supposed to represent. Despite the fact that union membership of women is generally high (and mandatory for state-sector employees), researchers suggest that the ACFTU pays scant attention to its members' gender-related labor concerns. Not coincidentally, women have failed to break into the upper echelons of ACFTU leadership (Cooke, 2010, 2011); the federation itself is characterized by a male-dominant culture and, in practice, either unwilling or unable to challenge elements of that culture that manifest themselves in the workplaces of its members. Understanding this background helps explain why a majority of labour activism in China, including the petition in this case study, is led by industry veterans, practitioners, and other committed individuals (Chen and Yang, 2017).

2.3 Online labour activism in China

With the rising awareness of workers' rights in China today (Chen, 2021), labour activism remains substantial despite the establishment of increasingly high political hurdles. According to the Chinese Labor Bulletin (n.d.; regularly updated), labour NGOs, students, and activists have staged over 14 thousand protests and strikes in the last decade.
Chen (2021) argues that these collective actions can be categorized into three types: moderate, liberal, and radical activism, which represent different ideologies that energise the labour movement. Moderate activism focuses on protecting workers' individual legal rights, for example, by seeking to redress work disputes through legal proceedings; liberal activism advocates for collective bargaining and worker representation; and radical activism calls for the restoration of socialism in China. He suggests that the state has encouraged moderate activism and constrained activities that seem to have liberal or radical narratives at their core; the current Chinese government is highly vigilant of collective actions and criticism of the market economy policy (Chen, 2021: 17–18).

Indeed, commentators (Howell and Pringle, 2019) observe that the current political leadership is criminalising more and more elements associated with labour research and activism and that a vague law that prohibits 'picking quarrels and provoking troubles' is being used to justify the arrests of labour activists and others (Hong Kong Free Press, 2015). The latest incident happened in September 2021: Fang Ran, a sociology Ph.D. student at the University of Hong Kong, was put into secret detention for researching labour conditions in Chinese factories in the southern manufacturing hub of Shenzhen (Hong Kong Free Press, 2021).

As the physical space for labour organising in China diminishes, more labour activism is taking place online. For example, in March 2019, an anonymous user uploaded a web page named 996.icu on Github, as a protest against the so-called “9-9-6” pattern of work. Workers filled the “anti-996” website with their own working experience, thus demonstrating the high prevalence of the internet industry practice of working from 9:00 a.m. to 9:00 p.m., six days per week (Lin, 2020). A parallel event occurred in October 2021, when another unidentified user created an open-edited spreadsheet that enabled other users to name their companies and share their actual working time (Shen, 2021). Both events attracted a large number of online participants and neither involved the work stoppages that labour activism in China typically relies on.

Researchers have noticed that digital platforms (including ICTs and social media) have become increasingly crucial for labour activism in the West, and there is an emerging academic literature on how digital platforms help to revitalise trade unions. This literature is written against the background of the substantial decline in trade unionism in Western countries over the decades (Gumbrell-McCormick and Hyman, 2018). Empirical evidence suggests that digital platforms can benefit trade unionism in many ways (see Geelan and Hodder, 2021). For instance, Panagiotopoulos’ (2021) study of the Twitter activities of 33 trade unions in the UK finds that social media can help extend the network of communication beyond people with a clear, expected, and immediate interest, thereby strengthening the power of union engagement, recruitment, and mobilisation.

The Western experience, however, is not directly applicable to China, for two reasons. First, the substantial decline in trade unionism in Western countries is not mirrored in China; second, Internet politics in China are totally different from the West. It is no secret that China's government censors collective expression on digital platforms (King et al., 2013). In response, activists in China have developed innovative strategies that enable them to promote their messages online. Gleiss (2015) finds that in order to avoid censorship, the Chinese labour NGO “Love Save Pneumoconiosis”—an organisation that campaigns for workers suffering from pneumoconiosis (the most common occupational lung disease in China)—adopted “polyphonic expressions” on social media platforms. This successfully “depoliticised” its work and made it less sensitive in the eyes of the authorities. More broadly, Gleiss finds that by creating new communities that connect previously divided populations (in her case, rural and urban) to support its cause, social media can facilitate

advocacy campaigns by articulating alternative discourses that challenge the hegemony of official discourses without directly confronting them.

Another commentary is made by Lin (2020), who looked at the “anti-996” campaign in China’s internet industry. He argues that the use of social media platforms enables a networked mobilisation of workers across different workplaces without a centralised leadership and potentially create a new basis of international solidarity. Together with the public consciousness, online labour activism creates an enormous account of public pressure on the targeted company. As he notes, these tactics “resemble other social movements such as Chinese feminist advocacy”, where they

> used social media to launch public campaigns around gender inequality and sexual harassment to raise public consciousness and to bring public pressure on the government and public institutions like the universities. (p. 55)

The current article stands on the shoulders of Lin, Shen, and others, arguing that labour activism in China today emerges out of opportunities that present themselves in China-specific contexts. Specifically, the 807 movement does not merely resemble the existing feminist advocacy repertoire; it was, indeed, ignited by the rising consciousness of women's rights in society, especially among high-salaried, well-educated female professionals in the internet industry.

3 Research methods

The author has a long research interest in studying industrial relation systems in Asia, and the research on which this article is based was conducted in the context of a broader project (2018–2021) that examines the industrial relations of China’s internet industry today. Alibaba, the largest employer in the sector, presents itself as a workplace with vibrant, healthy, and sociable culture. Its website proclaims that “Work Happy, Live Seriously” is “the Alibaba Way” and quotes its founder, Jack Ma: “the biggest differentiator between Alibaba and other companies is the emphasis on living a meaningful life” (see also Hsu, 2019). However, local journalistic reports often tell a different story. A Sina Finance (2021a) story about an Alibaba employee who complains about the long working hours and poor management went viral on China's Internet; another article explains Alibaba's

attempts to lay off seasoned (expensive) workers and retain younger, cheaper workers (Sina Finance, 2021b).

The “807” movement itself was highlighted by media in China and overseas, and the online portion of this research took the form of keyword searches on two Chinese search engines (Baidu and Sogou), which yielded news reports that have enriched the analysis. Keywords related to labour activism included “807 incident”, “Alibaba’s female worker”, “Ali-people petition” and so on. In addition, several news sources were monitored, especially the state-run news outlets, *People’s Daily* and *China Daily*, in order to understand the government's response to activism. These two newspapers are two most important newspapers published by the Chinese government to disseminate the state's messages and promote its propaganda (Zhu and Krever, 2022).

After the 807 activism took place, the author conducted additional semi-structured interviews with eight of Alibaba’s employees (five women and three men) and one Chinese tech journalist. These employees had worked for this company for at least 2 years, and the author met them during his fieldwork in China in 2020. As he had already left mainland China, the interviews were conducted via telephone, lasted around 1 hour and were audio-recorded with the workers’ consent. Our conversation took place in Mandarin Chinese and then was translated into English for this writing. These interviews enable triangulation of the findings from public sources and provide additional knowledge of gender relations in this specific company, and in China, at present. To ensure the interviewees' privacy, pseudonyms are used throughout.

4 Case study: The 807 online labour movement

4.1 Background to the activism

On July 27, 2021, a female employee of Alibaba, Ms Zhou, went on an overnight business trip with her male manager and other colleagues to meet a client in the city of Jinan. Ms Zhou claimed that she was sexually assaulted by the client when she was drunk and, afterward, when she was resting in her hotel room, she was raped by her manager. She reported her bitter experience to the Jinan local police. The police contacted her manager on the phone and directed him to go to the police station for questioning; he was released without charges a few hours later.

On August 2, Ms Zhou reported the incident to a higher manager. She demanded that he fire the manager in question, and at the same time requested leave from work. Her leave was not granted and no investigation was conducted. Days later, Ms Zhou contacted an even more senior manager, who promised to follow up on her complaints. Three days later, he told her that he could not do anything about the case. Further, he suggested that a no-action response was better for Ms Zhou herself, as her reputation would be tarnished if the incident became public.

When the author sought interpretations of the senior managers' refusal to take action regarding Ms Zhou's complaints, his interviewees provided the following explanations:

> In our company, men occupy most of the managerial positions, and the masculine culture compels them to dismiss women's concerns.
>
> (Amber, administration assistant)

> There is a "baotuan" culture in the internet industry. Baotuan originates from Honor of the Kings [a popular online game in China] and means that teammates will "stick together" and back each other up. Managers tend to cover up for each other, hoping the favour will be returned one day.
>
> (Vivian, marketing specialist)

Meanwhile, interviewee Lily reflected on societal culture in urban China:

> There is a victim-blaming culture in China. If a woman makes complaints about sexual harassment in the workplace, the first thing people would say is, "why are you dressing up like this? Are you inviting people to harass you?"
>
> (Lily, assistant manager)

Male interviewees, on the other hand, did not seem to agree with these statements. In Gareth's view:

> In our company, we have the most educated people, people with good character and decency. These are important criteria when we recruit people… There are

> circumstances when we laugh at each other, but these mean no harm. I don't know anyone who disrespects women.
>
> (Gareth, operations manager)

4.2 The flashpoint

The "incident" earned its name from the events of August 7, 2021. Driven by desperation, disappointment, and furiousness, Ms Zhou started to shout her demands in Alibaba's staff canteen, at the same time distributing handouts stating that she was raped by her manager, but the management had done nothing to follow up. The verbatim translation of the message on her handout is

> An Alibaba manager, NAME, raped and sexually offended his subordinate; FIVE OTHER NAMES know this situation but do nothing. I urge my company to bring justice to me.

On the same day, Miss Zhou uploaded a post on social media. The post provided details of the business trip and explained what had happened during and after she was raped: she attempted to commit suicide but was saved by her husband, while the suspect continued to work in the company as usual; she reported the event to the senior management, but nothing was done.

According to an interviewee, Miss Zhou's action is almost standard procedure for all Chinese women who work actively to defend their rights (*weiquan*):

> *When a woman experiences sexual harassment in China, she will first go to the police. And if the police have no follow-up actions, then she will talk about the event openly on social media platforms such as Weibo* [the Chinese version of Twitter] *to draw public attention. … This is how you will get follow-up actions… It comes from public pressure.*
>
> (Cynthia, project manager)

Both her online and offline actions sparked a fierce discussion on Alibaba's internal employee forum as well as the Chinese social media platforms WeChat and Weibo, and

immediately escalated the incident beyond the managers' control in the workplace. Other Alibaba employees started to dig into the details of the business trip; her manager's personal information was disclosed and circulated.

Vivian recalled her day at the office on August 7:

> *Suddenly I noticed hundreds of new notifications on my phone. People* [Vivian's colleagues] *created numerous new chat groups to discuss this event, … Some even proposed to march inside the company's headquarters.*
>
> (Vivian, marketing specialist)

On August 7, midnight, Daniel Zhang, the current Alibaba CEO, made his first comment on the internal employee forum. He described himself as "shocked", "angry", and "ashamed", and promised to give a comprehensive response to employees and concerned members of society. Jinan police, meanwhile, released a statement saying that they would actively investigate the incident.

These responses did not stop Alibaba's employees from organising themselves for further collective actions. Soon, someone created an employee chat group called the "Brave cows help group" (*Yonggan niuniu bangzhu xiaozu*) that aimed to promote an anti-sexual harassment culture and establish a mechanism against workplace sexual harassment. "Brave cows" (*Yonggan niuniu*), a popular slang term (i.e., meme) on China's social media, refers to people who are courageous with a sense of naivety. This chat group attracted over six thousand Alibaba employees within a day and, collectively, they drafted an open letter to the company.

4.3 Demands and conditions

The two-thousand-word open letter, titled "The Joint Initiative of 6000 Ali-People on the 807 Incident", was published on the evening of August 8. It contains five key messages (the original petition is published in People's Daily, 2021). First, the petitioners urged the police and the company to investigate the incident impartially. Also, answers and compensation need to be provided to the victim, Ms Zhou; second, they urged the company to reflect on its business culture, especially in how complaints are filed and responded to. The company also needed to reflect on the protection of women in the workplace.

Third, they urged the company to consider six collective demands:

- The company should engage with the victim's original complaint: provide her with three months of paid leave and if an investigation determines that wrongdoing occurred, terminate the alleged rapist;
- The company should provide extra support to the victim and her family, including counselling service;
- The company should publicize information related to the investigation process, including who, exactly, is conducting the investigation and what the investigation mechanism is;
- More generally, the company should establish a mechanism against workplace sexual harassment against women, including more training for new employees, production, and distribution of policy guidelines, elimination of the business drinking culture, and establishment of a hotline where workplace sexual harassment could be reported;
- The human resource department should serve the employees and not only the employer;
- Top management should meet workers in person instead of online, addressing their concerns. To this end, a communication mechanism between senior managers and workers should be built up.

Fourth, the petitioners asked that personal information of the victim not be publicised, in order to protect her privacy; they had seen a lot of personal information on the Internet forum; Fifth, they urged the company to pay continuous attention to sexual harassment in the workplace.

By the time this open letter was published online, it had been signed by at least six thousand Alibaba employees. Many of the petitioners shared the letter on the employee internal forum and other social media platforms, such as their personal WeChat accounts. While researchers (e.g., Gleiss, 2015; Xu, 2014) argue that in China, social demands and criticism online must be articulated in a language that is indirect and ambiguous in order to avoid censorship, the ”807” open letter gives direct and public voice to the workers’ demands. The benefits of this action are twofold: high transparency can let outsiders understand the workers’ demands, which is the first step to obtaining public support; and an open letter is highly provocative and, as such, requires immediate attention and response

from the employer. This strategy can prevent the worst-case scenario: the employer giving no response. In addition, in order to avoid state repression, the open letter was drafted in apolitical language and contains no criticism of the authorities, the police, or the Union.

Cynthia said that she signed the petition because she is sympathetic to the victim and wanted to do something: "*This is how you make your employer listen to your demands*," she said. Beyond signing, Cynthia also shared the petition on her social media and solicited additional signatures. Her response represents the rising feminist consciousness in China today, in which female professionals are more committed to defending their rights, without affiliating themselves with the political organizations nor reciting the state's doctrine of women's liberation. In fact, actions such as this petition campaign are seen as radical and often constrained by the ACWF, which is funded and led by the Chinese Communist Party (Cooke, 2010).

Some interviewees chose not to sign the petition:

> Actually, I was not paying much attention to the incident, I think it is just an individual event… It is some perverts committing indecent crimes… Over my years working in Alibaba, I have never experienced any sexual harassment in the workplace.
>
> (Vivian, marketing specialist)

As seen from Vivian's response, while rising feminist consciousness in China provides legitimacy to activism and support to activists, the extent to which this consciousness can motivate workers to organize also depends on external factors, such as the everyday work experience. In addition, others expressed concerns that there might be consequences if they signed the petition:

> I don't want to sign the letter because it may damage my employment record… It might affect my promotion in the future. I can't risk my career for this.
>
> (Daniel, senior programmer)

These responses might also explain why only six thousand employees signed the petition in an organisation with over one hundred thousand workers: if workers only see this as an individual event, then institutional changes are not necessary. Daniel's response also

highlights a major weakness of (online) labour activism in China: without institutional protection, activist workers constantly face the danger of retribution from their employer. While online petitions do not require participants to reveal their true identities, the reality is that Internet service providers and social media platforms in China require all users to register their accounts with real identification, which makes self-given social media pseudonyms traceable. As a result, some workers choose not to participate in labour activist events and others choose not to discuss the activism online (Liu, 2022b); both elements reduce the impact of labour activism.

4.4 From workplace to society

The open letter and the entire discussion surrounding Ms Zhou were quickly picked up by the general public on social media, and “807 incident” became a trending keyword in China’s search engines. People began to talk about business drinking and “ice-breaking” cultures (a common practice where newcomers are compelled to play intimate games during their new employer's orientation week) in China’s internet industry, and most comments showed sympathy toward Ms Zhou. This indicates that online labour activism can provide opportunities for people to express their concerns and challenge the dominant social discourse, which claims that each woman, individually, is responsible for ensuring that she does not become the victim of a sexual crime. Some shared their experience as ex-practitioners in the internet industry, criticising the result-oriented business culture and gender inequality in the workplace. Other trending keywords include “how to keep evidence after being raped”, “Alibaba's announcement”, and “Alibaba suspect male workers” (Baidu.com, 2021).

The state took an interest in the case almost from the moment it was made public. On August 9, a *People's Daily* column slammed the “sexual harassment incident that happened recently” and the corporate culture in China, without directly mentioning Alibaba. A more critical commentary published by *YouthSurfing*, a branch of the *People’s Daily*, warned Alibaba not to believe that it is too big to be regulated by the state. Also, the All-China Women's Federation, the official political organization for women in China, released a statement saying that it is paying close attention to the movement. Without any doubt, these public interjections by powerful political actors created an enormous amount of pressure on Alibaba's senior management.

Meanwhile, the ACFTU was silent, which may be due to the fact that Alibaba, like most privately owned companies, does not host an ACFTU branch. This is because the labour federation traditionally has been seen as part of the political organisation. Private enterprises in China usually have low interest in establishing an ACFTU unit in order to maintain an apolitical business environment. Wright (2018: 390–392) also notes that ACFTU branches in private enterprise are viewed by workers as ineffective and illegitimate representatives. In addition, as shown by Liu (2022b), Unions in China are often associated with helping the economic and socially marginalized communities. Technology workers are not members of the organization nor are they members of the communities the organization is most interested in serving. Hence, it is not surprising that no interviewees mentioned unionism when discussing the 807 movement. Past case studies (e.g., Chan and Hui, 2012) on labour activism in China reveal workers' interests in having their own representation or a (re)formation of the union during or after the actions, but these demands are not seen on the 807 movement. Perhaps Alibaba workers lack consciousness of their labour rights, but it is more likely that they are pessimistic that unionism can contribute to improved industrial relations in China's Internet industry.

4.5 The outcome

On August 9, Daniel Zhang announced on Alibaba's internal online forum that the accused manager had been dishonourably discharged, the senior managers who refused to follow up on Ms Zhou's complaints had been compelled to resign, and the human resource director would receive a demerit penalty. To answer the concerns raised by the general public, especially from those former employees who shared their own experiences of gender discrimination, Zhang stressed that there is zero tolerance of sexual crime in Alibaba (People's Daily, 2021). On August 12, Alibaba established a special working group that reports directly to the board of directors. The group is tasked with fighting against workplace misbehaviour and unconditionally supports workers against workplace sexual harassment and business drinking culture (China News, 2021).

All interviewees described this outcome as a "success": the action attracted the attention of the top management, and the top management responded in a meaningful way. Vivian believes this petition made the senior management more aware of sexual crime in the company, and they might pay more attention to women's rights in the future. This response

supports the idea that a successful activist movement need not include institutional change. This perspective fits into what Chen (2021: 6) describes as moderate activism, as it seeks to protect and promote workers' individual rights within the existing legal framework and correct labour practices that deviate from the laws rather than advocate for collective bargaining or worker representation.

Indeed, interviewees were sceptical about the ability of the one institutional innovation that emerged from the incident. When asked whether she believed this group would be able to fight gender discrimination against women in the workplace, Amber said, '*it all depends on what policy is implemented in the future.*' Cynthia was grateful that, '*at least … it shows that the senior management is paying attention*.' Table 1 summarizes the workers' demands and the management's responses:

Table 1. Alibaba workers' demands and the management's responses

Demands	**Responses**
The company should provide answers and compensation to the victim.	Key players were fired, forcibly retired, or given demerits; compensation is not mentioned in the announcement.
The company should reflect on its business culture and the protection of women in the workplace; and improve the channel of complaints.	A working group against workplace sexual harassment has been established, which consists of five female senior managers.
The company should consider their collective suggestions: 1. terminate the suspect after the investigation and offer her a paid leave of three months; 2. provide extra support to the victim, including counselling service; 3. publicize the information related to the investigation process; 4. establish a mechanism against workplace sexual harassment on women; 5. The human resource department should serve both the employees and the employer; 6. Top management should meet workers in person.	1. The suspect was dishonourably discharged; paid leave is not mentioned; 2. No extra support is mentioned; 3. Investigation results, if any, have not been announced; 4. A email and hotline for reporting workplace sexual harassment was established; 5. The human resource director received a demerit penalty; 6. No special arrangement was made to meet workers in person.
The company should not publicize personal information of the victim in order to protect her privacy.	The personal information of the victim and the alleged culprit have not been publicized (except their surnames).
The company should pay continuous attention to sexual harassment in the workplace.	A working group against workplace sexual harassment was established.

4.6 Dilemmas in online activism

On August 14, Jinan police announced the results of its investigation: while they confirm that Ms Zhou's client and her manager did indecently offend her, the client carried condoms with

him and her manager purchased condoms before entering her room. There is no evidence showing she was raped, so their indecent actions did not rise to the level of a criminal offense. Further, analysis of Alibaba's business record indicated that Ms Zhou went on this business trip voluntarily and that she drank alcohol of her own free will (*China Daily*, 2021).

Two weeks later, on September 6, 2021, the procurator's office released a similar statement: its own investigation led to the conclusion that the "indecent actions" (*qiangzhi qeixie*) committed by the client and the manager did not constitute a criminal offense, so arrest warrants would not be produced. However, neither the procurator nor the police provided details of what actually happened during the business trip, for instance, what 'indecent actions' had been done. The 807 incident has become Alibaba's "Rashomon" and the truth remains untold.

On its face, the logic of the procurator's statement is contradictory: A person who is drunk is incapable of giving meaningful consent, so indecent actions under these circumstances must constitute a criminal offense. However, some interviewees disagree, because

> in China, when someone sexually offends you, but you do not explicitly reject him, for example, when you are drunk so you are not capable of saying no, then people assume this act is not against your own will.
>
> (Lily, assistant manager)

As the author observes, the procurator's statement undermined the legitimacy of the petitioners and also had a chilling effect on Alibaba's employees. They no longer are certain about what actually happened, and therefore no further collective actions have been taken. This points to another disadvantage of feminist labour activism: the continuity issue. As discussed, feminist protests in China today are mainly mediated through social media platforms rather than official institutions, and online public discussions are easily monitored and censored by the state (China Labor China Labour Bulletin, 2021). When an activist movement is event-driven (e.g., a sexual crime in the workplace), the activism can lose its momentum once the conflict is resolved or the "deviant practices" have been corrected. In fact, Taylor et al. (2003: 29–35) argue that the strategies of mediation and arbitration have

been widely adopted by the ACFTU to demobilize workers' collective actions and undermine their influence in society.

Last but not least, as observed by the author, the contention that surrounded Alibaba's 807 movement also set off alarms about workplace culture and misbehaviour at other tech companies in China. For instance, Tencent released a statement affirming its official position that 'there is zero tolerance of sexual harassment in the workplace' (Sina Finance, 2021c). However, interviewees doubt that this incident will have a meaningful, long-term impact on women's rights, either in the internet industry or in society as a whole. This is because, to their minds, activism in the internet industry cannot solve the structural problem of sexism against women in society.

> It is not only in the internet industry but also in other large enterprises, and the state-owned enterprises,… and it is not only in the workplace, but also in social activities after work. These activities [against women] are very common.
>
> (Samantha, tech journalist)

> This incident has inspired more Chinese women to defend their rights. But that is it. If there is no legal change nor institutional change, nothing will be changed.
>
> (Karen, administrative officer)

> The Chinese society gives very little space for women to give their voice… and the law is not on our side. That's exactly why social media platforms are so important: to defend women's rights.
>
> (Amber, administration assistant)

By October 2021, keywords related to this scandal had been removed from the trending sections of Chinese search engines, and some of the online discussions on social media platforms have become inaccessible. As previously highlighted by Gleiss (2015), social media in China are closely monitored by the authorities and the platforms; when a case becomes too prominent and problematic, the government might limit access to online content, ostensibly to maintain social harmony (see also China Labor Bulletin, 2021). Meanwhile, public opinion started to turn against Ms Zhou. Some social media posts openly

attacked her as a liar, a ‘malicious scumbag’ who ruined the careers of her managers and probably concocted the whole event (e.g., Zhihu.com, 2021). Researchers (e.g., Mao, 2020; Wu and Dong, 2019) note that ‘feminists’ tend to be unpopular on China’s Internet and people who defend women’s rights often face immediate and harsh criticism. In the same vein, this research finds that labour activism motivated by feminist consciousness also shares these challenges, both online and on the ground.

5 Discussion

Since the 1980s, researchers have paid more attention to the synergy between labour activism and social movements, particular in the context of global South. Some early studies of this “social movement unionism” include Waterman’s (1979) writing on the transport workers’ strike in India, as well as Webster’s (1988) study on South African workers struggle against the apartheid regime in 1980s. The essence of this theory is it does not simply represent a different union model but a different understanding of the role of the working class and its typical organisation in the transformation of society. Moreover, Waterman (1991: 3) believes this model is fundamentally different from the Marxist-Leninist conceptualisation of trade unionism. He believes that the political unionism that motivated by the leftist ideology is unable to keep up with the realities of the new, progressive social movements that are non-economic and political, for instance issues that related to gender, ecological and ethnic relations. This new wave of social movements, as Waterman sees them, contain a broad support base across society that could reinvigorate labour struggles. As he (Waterman, 1991: 24) put it: ‘the labour movement is increasingly recognizing [that] neither socialism nor nationalism has proven capable of emancipating workers, people and peoples. Perhaps social movement unionism offers an alternative, worldwide, and continuously renewable project’. Therefore, to Waterman and his followers, the joint-force between labour and other social movement in essential in striving for social (and workplace) changes. Over the last two decades, unions studies in the advance capitalist economy also started to adopt this concept to describe and theorise on the efforts of progressive unions that go beyond traditional business unionism (Frege and Kelly, 2003; Turner, 2005; Voss, 2010; Engeman, 2015). Instead of focusing on collective bargaining and member presentation, these unions form alliances with the broader social movement and extend their organisation to the ‘unorganised workers’ to fight for workers’ welfare.

While analysts of social movement unionism do not ground their theory in leftist perspectives of class struggle, they have not 'retreated from class' and dismisses the importance of workers' identity, as critics like Wood (1988) have suggested. Indeed, despite social movement unionism's acknowledgement of the importance of other social forces, the centrality of workers has been strengthened in at least some contexts. For instance, Moody (1997) argues that although social movement unions form alliance with other social movements, they continue to 'provide a class vision and content that make for a stronger glue than which usually holds electoral or temporary coalitions together.' Class struggle remains the central focus, and labour 'seeks to craft bargaining demands that create more jobs and aid the whole class… [and] multiplies its political and social power by reaching out to other sectors of the class.' (Moody, 1997: 4–5). Therefore, according to Moody, social movement unionism is about expanding unions' goals from specific workplace concerns (e.g., wage, working conditions) to some broader demands that could have a 'positive impact on other working-class people' rather than dismissing workers' power and their role as an agent of change. In a similar vein, Seidman (1994) suggests that social movement unionism shows a shift from 'restrictive craft unionism' to a wider movement that 'defined its constituency as broadly as possible and took up issues ranging from improved social services for both urban communities to land reform and expended electoral participation.' Workers formed the core of the movement, which then expanded their concern to other causes and influenced them so that 'urban social movement took on a specifically working-class character as they confronted authoritarian states' (Moody 1997: 199).

In additional to the central role of workers in the new forms of labour movement, and the alliance with other social communities, both Moody (1997) and Seidman (1994) share another similar lens in the essence of the theory: social movement unions are capable of challenging the institution that traditional union represented, which is highly relatable to this case study. In Seidman's (1994) research, trade unions in Brazil co-operate with the military regimes to prevent workers' resistant; and for Moody (1997: 271), trade unions hold a contradictory position, because on one hand they fight to defend workers' interests, but at the same time they 'attempt to hold the lines of defense through a long-term stable bargaining relations' which could be considered as restrictions to labour activism. Theorists (Seidman, 1994; Moody, 1997) believe that social movement unions could overcome this institutional barrier because they value more on union democracy and membership involvement, and most

importantly a vision and practice that reach beyond the working class to other sectors in society.

However, this position is criticised by some contemporary writers, for instance, Park (2007) argues that the case of South Korea does not show that social movement unions were independent from the institutional-political force, as the Korean Confederation of Tarde Unions was heavily influenced by the Democratic Labour Party and their membership often overlapped. In the US context, Voss (2010) finds that while ideally social movement unionism is supposed to be initiated through bottom-up activism, in reality, most of the successful campaign of the union revitalisation started with a top-down approach facilitated by a strong national leadership and trade union staff members who had social movement experience. Reflecting on this debate, the 807 activism demonstrates that labour activism and social movements can be fully detached from established political forces: The ACFTU in China had showed no support to workers at all, and it was the concerned workers who organised themselves; the petitions were drafted by workers themselves, they discussed their protest strategy and collective demands online, and later the petitions were circulated by Alibaba's employees and the wider society. This activism is the perfect example to demonstrate the power of bottom-up labour activism powered by the feminist movement in China.

Moreover, this case study challenges one the essence of the theory: from all the cases discussed above, the assumption of social movement unionism is that the power of social movement needs to be materialised through unionisation to defend workers' interests. However, this case study demonstrates that unionisation may require certain preconditions in society, for example, experience in labour organising, legal protection for unionisation, other institutional support, or a vibrant civil society. Without meeting these preconditions, the transformation of power from socials movement into unions could be extremely difficult. However, even without unionisation, Chinese technology workers still benefited from the wider feminist movement in society and remained agents of change in society though spontaneous, ad hoc (online) protest. The research findings suggest that these barriers to institutionalising the movement do not break down the synergy between labour activism and social movement.

6 Conclusion

In conclusion, the 807 movement is the largest labour activism event in the short history of China's Internet industry. Despite decades of government efforts to improve gender relations and work conditions, this event shows that labour activism remains essential to defend workers' rights and their dignity. What is unique about this activism, and what makes this activism so powerful, this article argues, is that it happens in tandem with rising feminist consciousness in China, which provides legitimacy for worker activism. This article also presents the challenges of conducting online labour activism in China, the strategies adopted by technology workers, and the state's responses.

The petition was a successful case of moderate activism, as it occupied the headlines of China's Internet, focused public attention on workplace sexism, and inspired more women to speak up about their experiences of workplace sexism in China. Theoretically, moderate actions have the potential to become powerful driving forces that generate the kind of legal/institutional changes that might reduce gender inequality and further protect women's rights in the future. The research findings of this study, however, show that such transition is challenging in reality, and activists often meet restrictions from the state's actors that demobilize the movement. After studying nearly 200 cases of labour protest in China from 1994–2004, Solinger (2007: 421-422) observes that Chinese workers commonly send petitions to management as a strategy to express their discontent; and if 'the negotiations were deadlocked', workers move up the administrative hierarchy to the municipal government, provincial government, and some even travel to Beijing to report the malfeasance they experience and fight for justice. The 807 activism shows that the digital space provides an alternative avenue for workers to be heard without going through the bureaucracy.

Moreover, this article argues that China's rising feminist consciousness has a contradictory effect on workers' power: on the one hand, the idea of gender solidarity provides legitimacy, motivates workers, and provides a moral basis for public and trans-industrial solidarity. These bargaining powers are important because workers in China, including technology workers, have weak legal and institutional protection. On the other hand, interviews indicate that workplace sexism is understood to be a highly subjective and individualized experience, and collective actions in response to sexism-related incidents tend to be event-based and thus non-continuous. These disadvantages restrict the possibility of institutionalizing workers' bargaining power in gender-relevant industrial relation struggles,

because workers see conflicts at work (in this case, a sexual crime), which are seen as a result of sexism rather than industrial relation issues. Nevertheless, the activism documented here contributes to a better understanding of the rising feminist consciousness in contemporary China. This increasingly influential social force is separating itself from both the state's discourse on women's liberation and from the political organizations that had been constructed with that discourse at their foundation.

Lastly, the author acknowledges the article’s limitations, particularly related to the methods employed. Conducting more interviews with Alibaba workers, especially with those involved in drafting the petition, would enrich the empirical findings, but additional interviews were not possible. Additional media reports also might enrich the findings, but these had been removed before the author could retrieve them. Finally, the tentatively introduced generalizations regarding gender relations in China’s internet industry deserve a proper scholarly treatment, as do questions related to worker motivations for activism against workplace sexism in different workplaces beyond the digital economy. These could be possible directions for future research.

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Chapter 5 Reflections on Conducting Fieldwork under Digital Surveillance: Investigating Labour Politics in China's Internet Industry

Abstract

This article discusses how digitally mediated state control of citizens and society are affecting fieldwork in the People's Republic of China. The aims of this article are: (i) to present my first-hand experience of conducting fieldwork in Shanghai and Hangzhou as a foreign investigator; and (ii) to exposit two types of digital surveillance encountered during fieldwork. The first is referred to as "digital profiling": state authorities' profiling of researchers based on their online identity and online activities. The second is "digital monitoring": state authorities' monitoring of the communication and interactions between researchers and informants online. In the final part of this article, some of the ethical considerations pertaining to the conduct of fieldwork under digital surveillance in China are considered. Consequently, it is hoped that the analysis presented here will benefit researchers at all career levels who are planning to conduct ethnographic fieldwork in authoritarian countries such as China.

Keywords Authoritarianism; digital surveillance; ethnographic research; labour politics; China

In mid-July 2020, undertaking fieldwork in China, Chris, an important contact, requesting an evening meeting, walking around the jogging track of a residential area in the city of Hangzhou.[1] Chris is a seasoned venture capital investor in China's digital technology and internet industries and is a key person for connecting me with other informants in those industries for my research on their working conditions and on workers' levels of job satisfaction. Undertaken from a sociological perspective, this research involves detailed ethnographic observation in workplaces and many in-depth interviews with technology workers in-person and on social media platforms. Prior to fieldwork, a colleague had suggested contacting Chris in China.

Chris was initially contacted on WeChat, a Chinese social media platform considerably more powerful than its Western counterparts, and he was to be the first interviewee for my fieldwork in Hangzhou. However, despite having been referred to him by his friend and colleague and pledging to ensure his anonymity, Chris refused to participate in a formal interview, insisting that he could not talk to outsiders without permission from his investment firm. He made this especially clear when I told him that I was planning to discuss the 996 controversy with him – a topic which is censored online in China due to its political sensitivity.

Surprisingly, Chris's refusal to be interviewed was followed by an invitation to join him for an evening jog the next day. This had, he said, been his daily routine since his arrival to Hangzhou some years ago. That night we had a two-hour walk around the residential area, discussing almost everything that would have been in a formal interview with him. Finally, I realised that Chris had in fact intended to talk about the topics related to my research, but that any conversation had to take place in an environment that was unlikely to arouse suspicion.

The meeting with Chris illustrates how fieldwork in countries with authoritarian political regimes like China can be much more complicated than fieldwork in democratic countries. However, as Morgenbesser and Weiss (2018, 385) argue, scholarly discussions of strategies for undertaking fieldwork are – especially in political science – almost exclusively focused on fieldwork in democratic societies, with relatively little discussion about fieldwork in countries where civil liberties and political rights are non-existent, limited or not consistently or well protected. Consequently, this article provides some reflections on how researchers can navigate fieldwork in today's China by evaluating strategies previously

proposed by researchers and discussing other possible research strategies in light of recent developments and especially those pertaining to the state's digital surveillance.

In this article, digital surveillance refers to the state's monitoring and control of both physical and online content, as well as communication and other forms of behaviour by means of digital technologies. As Ryan and Tynen (2020, 1) point out, authoritarian states are becoming ever more capable of monitoring online activity and, when it comes to researchers engaging in fieldwork, this could be said to constitute a new form of invasion on the part of the state into private lives, significantly affecting their ability to build and maintain relationships with interviewees and other informants. However, digital surveillance is not only a determinant of fieldwork feasibility but, increasingly, personal safety also. This is especially true for foreign researchers and so there is an urgent need for academics to review the rapidly evolving situation in China.

Chinese authorities, especially for the current administration, have increasingly sought to prevent discussion of the anti-996 campaign in China's internet industry, as well as other instances of labour activism in the country (see Howell and Pringle 2019). As the government sees labour activism as harmful to "social harmony," it also seeks to restrict academic research and public discussions of workplace exploitation and labour rights (see *BBC News*, May 31, 2017; *Financial Times*, March 29, 2019). Very often, activists, journalists and researchers have been arrested for allegedly "picking quarrels and provoking trouble" (*xunxin zishi*) in China (see Hong Kong Free Press 2015).

Fieldwork in China's Authoritarian Political Culture

The fieldwork undertaken included six months in Hong Kong (from January 2020 to June 2020, though research was disrupted by the COVID-19 pandemic) and nearly three months in Shanghai and Hangzhou. After completing around three weeks in Shanghai for mandatory quarantine, two COVID-19 tests and other paperwork, the rest of the research time was spent in Hangzhou—the so-called Silicon Valley of China. During this period, I resided and conducted ethnographic research in what is referred to as the Hangzhou Internet of Things Town, the designated area for online companies. It was there that I met many of my interviewees who are working for various companies in the internet industry, from e-commerce and entertainment companies to server providers and internet infrastructure suppliers, providing such equipment such as routers.

While in China, multiple in-depth, semi-structured interviews were conducted as well as numerous informal discussions with technology workers. The conversations took place in Mandarin Chinese and usually occurred in cafes or restaurants near their offices. On a few occasions, the interviews were in the worker's home in Hangzhou or during weekend social gatherings with other technology workers in the city. Most workers are from other provinces and moved to Hangzhou for job opportunities in the internet and technology industries. In addition, their daily updates on WeChat were followed, providing a better sense of their working life. Other than these internet and technology workers, their friends and spouses, technology industry investors and tech journalists were interviewed, in-person, over the phone and online. Further, with the help of interviewees and other informants, I obtained a visitor pass which allowed visits to some workplaces to observe the business environment and interactions at the workplace.

During the fieldwork, I was concerned that the authorities would monitor my physical and online activity, including communications with the research participants through social media. As a result, several strategies to protect both researcher and informants from state surveillance were adopted. One such strategy was maintaining a high degree of flexibility in research design and methodologies.

Indeed, previous treatments by scholars on the practicalities of fieldwork tend to focus on methods of data collection. These include methods of data storage and security within the country and are to be employed during the fieldwork itself. While such measures are certainly indispensable, these studies underestimate the importance of the process of preparation before engaging in fieldwork, for a lack of preparation may put the researcher at risk of detainment, expulsion from the country and other serious legal consequences, as well as the confiscation and destruction of their data.

Over the last two decades, a number of publications have discussed the practical challenges of conducting fieldwork in states with authoritarian regimes (see, for example, Shih 2015; Reny 2016; Janenova 2019). These studies often discuss encountering targeted surveillance, such as spying and telephone tapping, which can create stress, fear and, in severe cases, even paranoia (Glasius et al. 2018, Ch. 5). In recent years, researchers have become increasingly aware of the fact that fieldwork in authoritarian countries must be

conducted with extra caution, not only because state surveillance may significantly impact the processes of data collection and knowledge production, but also because the research activities involved in the fieldwork can entail considerable risks to the researcher and their collaborators who reside in those countries.

While some argue that fieldwork-based academic studies contribute to a more comprehensive understanding of the politics and society of a given country, few details have thus far been provided in the literature on the challenges that researchers encounter in the field in authoritarian countries (see Heimer and Thøgersen 2006, Ch. 1). The methodological challenges are usually discussed privately, because they are seen to be less significant in academic publications compared to research findings, and sometimes the admission of methodological limitations can imply the imperfection of the data presented in the given study. Frank discussion of fieldwork experiences in a particular country may also invite criticism from supporters of the regime or raise the unwanted attention of the authorities, which may create barriers to conducting fieldwork in the future.

However, the result of this lack of discussion and debate on problems encountered both during the planning of and during fieldwork prevents academics from being sufficiently prepared for undertaking fieldwork and discussing possible coping and management strategies, such as choosing the right virtual private network (VPN) for navigating the internet and bypassing China's internet firewall and, in data collection, understanding the slang on Chinese social media platforms. The abduction and murder of Cambridge University doctoral student Giulio Regeni during his research on trade unions in Egypt in 2016 is a tragic reminder of the physical risks posed to researchers when conducting fieldwork in authoritarian countries (see *BBC News*, January 25, 2021). This is especially the case when that fieldwork relates to politically sensitive topics from the point of view of the political authority.

Against this background, some studies have been dedicated to bridging the gap between research theory and practical limitations by discussing the challenges of fieldwork related to the socio-political difficulties around the world (see, for example, Glasius et al. 2018). These challenges include research feasibility, the accessibility of documents, databases, interviewees and other informants, the trust and trustworthiness of informants, as

well as other ethical concerns in fieldwork (Reny 2016; Deakin and Wakefield 2014; Ryan and Tynen 2019; Janenova 2019).

While these studies have contributed to a better understanding of the research challenges in countries with authoritarian governments, there has been surprisingly little description of how researchers experience digital surveillance during their fieldwork. More importantly, scant attention has been given to understanding how digital surveillance contributes to what Glasius and colleagues (2018, 9) identify as "uncertainty and arbitrariness" which are features of politically authoritarian societies, let alone possible coping or management strategies for researchers.

When it comes to conducting fieldwork relating to socio-political subjects in China generally, however, there has been significant work. Heimer and Thøgersen (2006), for instance, highlight three important themes pertaining to the difficulties of fieldwork in China: the presence of the party-state, barriers to access of important documents and persons and greater difficulties in arranging productive collaboration – all of these being related to the formal control or ideological influence of the Chinese government.
More recently, researchers have been keen to draw greater attention to the potential risk of conducting research pertaining to labour conditions in today's China by making a comparison between the leadership styles of the Hu-Wen administration (2002–2012) and Xi's administration (since 2012) (see, for example, Howell and Pringle 2019). The approach adopted by previous Chinese leaders is generally regarded to have been more consultative and responsive (Teets 2013; Heurlin 2016). However, Xi's leadership has relied heavily on the new tools that the internet and new communication technologies provide to coerce and repress dissenting voices (Xiao 2019).

This has been especially true when it comes to employment disputes, labour research, and discussion of these issues both online and offline. In this connection, Fuchs, Tse and Feng (2019) systematically review the repressive measures employed by the Xi government – what they claim constitutes a new form of coercive authoritarianism. It includes: the crackdown on numerous civil society organisations, on human rights lawyers and women's rights activists in 2015 (*The Guardian*, July 13, 2015; *BBC News*, March 9, 2015); the mass arrest of labour activists and researchers in 2016 and 2017 (*The Guardian*, September 27,

2016; *South China Morning Post*, February 16, 2017); and academic constraints imposed on higher education institutions, targeting both domestic universities and overseas academic publishers, such as the Cambridge University Press (*The Guardian*, August 22, 2017). Scholars generally agree that the kind of repression produced by these actions on the part of the state has posed an increasing number of new challenges for researchers intending to conduct fieldwork in China. These challenges include greater difficulties in accessing pertinent documents and potential interviewees, physical risks and potential legal consequences, potentially inferior data quality, and too high a level of data transparency (such that the names of one's interviewees and other informants could be visible) (see, for example, Shih 2015; Reny 2016).

While scholars are gradually gaining more knowledge about contemporary labour politics in China, there seems to be a lack of consideration about how such repressive politics affect fieldwork in concrete terms. This, in turn, leads to a lack of discussion about what measures researchers can and should take to safely navigate this environment and determine whether their intended fieldwork can in fact be feasible.

Digital profiling and the difficulties of gaining entry into China

Access to research sites and informants is a common challenge for foreign scholars researching politically sensitive topics in China. Because research taboos can change over time and are subject to local variations, it is sometimes difficult to know beforehand which research topics will be affected by politically motivated restrictions on data collection. This uncertainty also implies that physical and mental preparation as well as an assessment of potential risks are essential before entering the country. A coping strategy previously suggested by researchers is to seek an official status or affiliation with a local institution or to collaborate with local institutions such as university or government units (see Morgenbesser and Weiss 2018, 389–392). Yet such a strategy potentially raises issues about the truth and equity of an academic research project, as one may need to change the research topic to a direction that is more palatable for the regime.

In addition, it needs to be pointed out that in recent years such international collaboration has become more difficult (and sometimes impossible) due to the political tension between China and Western countries over topics relating to human rights and other

social issues. It is therefore particularly difficult when researchers are pursuing projects on social or political subjects. The same can be said for postgraduate researchers such as international doctoral students seeking official affiliation with Chinese universities. For instance, for international applicants to secure visiting academic positions in Chinese institutions, they are normally required to already be in possession of a doctoral degree and an outstanding academic record. Added to these difficulties are the restrictions since 2020 on travel to China and the regulations aimed at controlling movement in the country due to the COVID-19 pandemic. These further restrict the ability of foreigners to enter the country and travel between cities.

As a researcher with an interest in China's internet industry, I have been able to travel to Shanghai multiple times over the past five years without being affiliated to any Chinese institutions. However, my most recent trip, in June 2020, was unlike any I had undertaken before. When I was at the immigration counter in Shanghai Pudong Airport, the immigration officer took my visa and asked me to wait in a corner next to the counter. In a few minutes, two officers (I will call them officers X and Y), each carrying a hand-held camera with the recording light on, instructed me to go with them. They never identified themselves, and I could not even see their faces nor badge numbers as both were in full personal protective equipment (PPE).

Further questioning regarding my visit to China was at the National Security Office (*guoan bangong ting*), and all of it was video-recorded. Meanwhile, a third officer, also in full PPE, brought my luggage to the office. Officer X began asking questions in a serious voice seeking some personal information (name, age and occupation) and repeatedly asking about the purposes of my trip and whether or not I had participated in any protests or illegal activities in Hong Kong. The officers also asked me to provide local Chinese contacts and their telephone numbers. They then called them to verify my identity.

At the same time, officer Y emptied my luggage and inspected everything, including my clothes, shoes, food, personal hygiene products and books. He checked random pages in books for anything hiding inside or any inappropriate content from the point of view of the authorities. Officer Y also demanded that I unlock my mobile phones and laptop, read through my chat history and looked at my social media accounts, my browser's bookmarks and looked at literally every single photo on these devices. When he found some photos

related to protest movements in Hong Kong, he asked that I explain why such material was on my phone and again whether or not I support such movements.

This situation was very uncomfortable, even if I was at least somewhat prepared for this profiling. During my stay in Hong Kong, I learned to avoid posting any material related to political disputes between Hong Kong and China on social media, so as not to raise the suspicions of any of the authorities monitoring social media platforms. I also tidied up my social media profiles by unfollowing political leaders who are unpopular from China's official point of view, such as British human rights activist Benedict Rogers. I also removed phone apps which are prohibited in China, including Facebook and Twitter, as well as any pictures and browsing history related to official "red lines."

However, I did not just erase everything on my phones. Instead, I kept a decent visual record of my life in Britain and in Hong Kong so as to portray myself as anything but a "troublemaker." I also kept some photos of a sightseeing trip to Shanghai in 2019 to convince the authorities that I was not an activist.

At the end of their investigation, the officers directed that I sign a declaration that I was being honest with the officers and was willing to bear the legal consequences for misleading them. After three and a half hours, I was released from the airport and was transported to the designated hotel for the 14-day mandatory quarantine. Digital profiling is relatively straightforward and open to the subject, as I was told by officer Y that the authorities have been taking serious measures at border control due to the COVID-19 pandemic. Nevertheless, it seems reasonable to suspect that these measures have more to do with the political tensions between China and Hong Kong than the pandemic. The fact that I was a British national (overseas) born in the colonial Hong Kong, could also have been a reason behind this complication.

Digital monitoring on social media platforms

In recent years, those conducting research on work and employment in socio-political science have increasingly come to regard social media as both a research medium and a resource-rich site for investigation (see, for example, Lam and Harcourt 2019; Patrick-Thomson and Kranert 2020). This is particularly noticeable when studying platform workers, whose work and organisation are mainly organised by means of algorithms (see Wood et al. 2019;

Tassinari and Maccarrone 2020). In addition, during the COVID-19 pandemic, online interviews and digital ethnography have increasingly been recognised as natural alternatives to traditional methods of data collection usually employed in person (see Kara and Khoo 2020). Researchers argue that there are many advantages to collecting data through digital media. For example, Fontes and O'Mahony (2008) suggest that instant messaging is a cost- and time-effective method for conducting in-depth interviews. Käihkö (2020) also added that social media is particularly useful for reaching and interviewing specific groups (in his case, voluntary fighters in Ukraine). Käihkö was able to easily identify them in Facebook groups. Without social media, such identification could not have been done without walking into a warzone.

When in China, I explored conducting interviews with Chinese technology workers by means of instant messaging, as well as online video interviews. While these methods were convenient, it soon became evident that communication through Chinese social media platforms creates methodological challenges. This is because many Chinese believe that social media platforms, including their instant messaging and video-calling functions, are being constantly monitored by the authorities (see *BBC News*, June 7, 2019). This is because the government requires citizens and foreigners to register one's use of all kinds of communication services with accurate information for personal identification, including one's internet provider, mobile network and social media platforms (see Law info China 2016). The latest regulation implemented in 2019 even requires users to register with facial ID along with other personal identity information. The concealed and uncertain nature of digital monitoring creates and maintains a politics of fear in virtual communication, which, as Yang (1994, 20–21) wrote before the advent of fully-fledged digital surveillance, is a "powerful force in constraining actions and speech in everyday life … [such that] even the absence of direct threats to one's personal security … [does] not signal a dramatic change in the habits of wariness and self-protection."

For example, during interviews conducted by instant messaging, I asked my interviewee, Winnie, how she felt working under the 996 schedule. She replied with the text: "so tired." While such tiredness is understandable after 12 hours of work every day, it requires more explanation or elaboration in order to be fully meaningful as a reply to the question. Such a timid response could be due to the "informal, weak ties" which characterise

online relationships (Turkle 2011, 284–285). Yet her defensiveness could also be considered to stem from her awareness of the state's digital monitoring of social media platforms.

This passive attitude means that informants require a higher level of trust and emotional connection to open up and share their feelings about a given social issue with the researcher. In this case, I spent three days talking to Winnie on WeChat, about my personal life, my research project and my thoughts on China's internet industry, in order to build a relationship that made her comfortable enough to share her opinions in a less defensive manner. In this connection, Käihkö (2020, 85) warns us that the use of social media for one's research may lead to the blending of the researcher's professional and private lives and this tends to be more time-consuming than traditional interview methods.

Moreover, the politics of fear does not only apply to informants, but also to the researchers themselves. In interacting with more informants and potential interviewees on social media, I gradually found myself internalising this political sensitivity. I learned what questions not to ask on instant messaging platforms from their responses and altered my interview questions so that at the outset they were no longer workplace-specific, but rather touching on common, everyday topics. I also avoided asking questions related to the government on social media.

While our virtual conversations appeared to be completely apolitical, a few of my informants warned me that "the authorities are very likely listening to us" or asked "is that something I can talk about here [online]?" The interviewees did not make such warnings frequently. Most of them probably realised that monitoring may have been going on without deliberately mentioning it and in many cases they only answered questions in a very general, uncritical manner. This created a research problem because I could never tell who was generally feeling satisfied with their jobs and who was dissatisfied but felt unable to tell me on social media. These cases suggest that ethnographic research centred on workplaces and meeting informants in real-life situations remained crucial to the overall research project because they helped to ensure the validity of the data gathered using online methods.

Reflections on personal safety and research ethics

In late August, 2020, I began to worry about my personal safety in China. On a few occasions in the city of Hangzhou I realised that I was being tailed by some local people. Once a

random woman took a photo of me eating alone in a restaurant with her mobile phone, where there was nobody else around. On a separate occasion, I was followed by a man after I finished my workplace observation. We were walking in the same direction for a while, and I tried to get rid of him by standing next to the road and letting him walk past me. When he saw me stopped, he suddenly stood on the road and checked his phone and continued in the same direction when he saw me begin walking again. In most cases, however, one cannot prove such low-tech surveillance unless the authorities reveal themselves. In addition, an increasingly uncomfortable aspect of surveillance is that it does not only occur in digital forms. In China, and increasingly elsewhere, everyday spaces are monitored, such as by means of facial recognition cameras, check-in apps, especially during the COVID-19 pandemic.

As Käihkö (2020, 83) argues, the most important consideration of all when seeking to conduct research responsibly is that no harm comes to those who participate in it. The researcher must always be cautious, not only in choosing their methodologies, but also when choosing who to meet in the pursuit of pertinent information. For instance, while studying the leading activists who participated in the anti-996 campaign would have been ideal in furthering my research and perhaps more theoretically rigorous, this would have been difficult. Reaching out to such activists would bring risks to both them and myself as the researcher and might also risk the authorities further silencing discussion of the 996 work regime.

In addition, digital surveillance raises new threats to the anonymity of informants. While social networks are easily made and accessed online, allowing for the snowballing of the sample or pooling of potential interviewees, they also mean the authorities are more easily able to discover who a researcher has been in contact with. In addition, because digital monitoring can take place at the back end of the server, the chat log stored in social media platforms means that the authorities can read and copy the exact words of an informant without physically taking their devices away. From this perspective, the researcher must be careful in making fieldnotes. Ideally, they should be written on a separate computer without internet connectivity or should be written with encryption software. Some scholars (Hammond 2018, 4) have suggested that interactions over social media can be less risky than in-person interactions because informants can hide their true identity behind devices, which is an advantage when researching vulnerable groups such as people involved in sex work.

However, for the reasons outlined above, digital surveillance may in fact pose the risk of insufficient privacy of data to both researchers and informants.

An increased awareness of such privacy issues in recent years has resulted in solutions offered by new technology, including paid encryption software for messaging, telephone, and email, which allow data to be transmitted and stored with a higher level of security. Others also suggest using fake research profiles as an alternative. Yet, while this makes some sense, in practice, the use of such software may attract unwanted interest from state actors, risk the researcher and the informant breaking local internet laws and incurring severe legal consequences (see, for example, *South China Morning Post*, January 7, 2019).

Conclusion

This article has aimed to shed light on the conditions of research and fieldwork in today's China, illustrated with examples from researching labour politics in the country's internet industry. In presenting experiences during fieldwork, two types of digital surveillance were identified as contributing to the uncertainty and arbitrariness in conducting fieldwork in China. While digital profiling creates a more immediate threat and adds pressure for researchers, digital monitoring harms the relationship and trust between the researcher and the participants in their research. As social media platforms become ever more central to researchers' work and everyday lives, scholars must pay more attention to the challenges posed by digital surveillance as a tool employed by authoritarian governments.

Last but not least, it should be noted that the experience of fieldwork in China which is presented in this article should not be taken as representative of fieldwork pertaining to social or political research in China. As digital surveillance is unlikely to disappear in China, such variables as the timing of one's research or fieldwork, the local politics of the community in which one embeds oneself during one's research, one's research topic and the perceived "foreignness" of the researcher may lead to different experiences and challenges during fieldwork. In the end, there are no one-size-fits-all solutions in conducting research under digital surveillance, either China specifically or authoritarian states generally. It is hoped that this article will invite further academic discussion about this issue. As authoritarianism remains the dominant political model in many developing countries, the analysis presented in this article is also intended to benefit researchers at all career levels who are planning to conduct ethnographic fieldwork in these locations.

Notes

1 All the names of interviewees and informants mentioned in this article are pseudonyms for the sake of protecting their anonymity.

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Chapter 6 Discussions and conclusion: Work in China's internet industry

6.1 Thesis summary

In Chapter 1, the author introduces the theoretical motivations of this project while arguing that a pluralist industrial relations approach is the most appropriate intellectual apparatus for the study of the political economy of technology and its impact on work experiences in China's internet industry. It then explains the research design and methodologies, and details how research data has been collected. Chapter 2 is a study of the work experience in China's internet industry from a macro-industrial relations perspective. It argues that China's government has played a key role in shaping the work experience in the industry by promoting competition. It also finds that censorship of online labour activism and ambiguity in court decisions have lowered the interest of technology workers in organising and defending their rights.

Meanwhile, through the lens of micro-industrial relations, Chapter 3 looks at how management software is used in China's internet industry and creates a form of digital Taylorism, which increases work intensity, provides a higher income but proportionately lower share of the gains from increased productivity, and intensifies competition among workers. Chapter 4 is a general analysis of technology worker mobilisation against gender-discriminatory culture in the workplace, with extensive and detailed reference to responses after a sexual crime case at Alibaba was made public. It argues that, while rising feminist consciousness in China has the potential to strengthen labour activism, such consciousness is highly dependent upon individual experiences at work, and gender-related collective actions tend to be event-based and of limited continuity.

Chapter 5 reflects on conducting ethnographic fieldwork in China and discusses how digitally-mediated state control of citizens and society affects both researchers and research participants. Finally, in the present chapter, the author discusses the research findings, assesses the extent to which the earlier chapters have filled gaps identified in the literature review, and elaborates on the entire project's contributions to the scholarship of industrial relations and to academic debates on the future of work.

6.2 Original findings and contributions

The primary objective of this project is to investigate the work experience of China's technology workers, particularly with regard to how it is affected by government policy and corporate implementation of digital technologies in the workplace. It began with RQ1: How do China's technology workers perceive and experience the state's influence on industrial relations?

This project demonstrates convincingly that the state remains crucial to the analysis of industrial relations systems, and especially to understanding the collective work experiences of workers. Scholarly work on industrial relations in Britain has long focused on the study of unions. For instance, the Oxford School has focused on the 'institutions of job regulations', especially trade unions and collective bargaining, since the 1950s (Gospel, 2005:3). In the 1960s, as trade union activism gradually developed into a national issue, British scholars of industrial relations shifted their focus away from institutions to unions and workers activism (see Ackers, 2011: 311). This resulted a series of improvements in the understanding of industrial conflicts. Yet, employers and workers in the tripartite system gradually developed effective and non-conflictual bargaining relationships (Hyman, 2008: 259) in the democratic context, which is reflected by the decreasing level of industrial actions over the decades (Bordogna and Cella, 2002). This transition has inspired new sets of management philosophy, such as the 'employment relations' approach, which emphasises mutual interests and co-operation between employers and workers (i.e., a unitary interest instead of the pluralist interest) and the 'human resource management' approach that focuses on the development of employee benefits systems within organisations. As a result, some commentators suggested that industrial relations has become an outdated academic discipline. Industrial relations units at British universities faced pressure to restructure, and often become subunits of the business school, where they were merged with or replaced by more 'fashionable' programmes such as the MBA (Clark, 1995). This doctoral research project makes a novel theoretical contribution to industrial relations and the wider sociology of work by re-introducing and underscoring the importance and relevancy of the state to industrial conflicts and work experiences.

In addition, the empirical analysis in this thesis provides an original and much-needed understanding of industrial relations in China's internet industry. Chapter 2 shows that the

intense competition within the internet industry shaped by the Chinese government has a direct effect on prolonging the working hours and other forms of exploitation of technology workers. In industrial relations scholarship, William Brown has written extensively on how market competition shapes managerial leniency and consequentially lowers workers' wages. He (1973) argues that when a product is in high demand, workers can make better use of their bargaining advantage to improve their employment condition, such as to seek payment above their regular rates, regardless of local market conditions. The findings of this doctoral research partially fit into Brown's argument, as the informants reveal that technology workers in Digitech receive a higher salary than workers in other sectors. However, this welfare has little to do with managerial leniency; in fact, managers have only little autonomy as many managerial functions, such as pay evaluation, rely on Digitech's employee management software. By asking RQ2: 'what is the actual work experience in China's internet industry, and how is it being affected by the implementation of digital management technologies?', this project finds that the implication of management software can have a dehumanising effect on the workplace, as it increases work intensity and inter-worker competition. All of these characteristics contribute to what this thesis refers to as "digital Taylorism", which has a continuity with the past study of knowledge workers, along with some new, distinctive features.

When Chapter 3 was submitted to *Economic and Industrial Democracy*, the author pitched it as follows: "To the author's knowledge, … the first to apply the underutilised concept of "Taylorism" to examine how management changes have affected Chinese workers' experience in the workplace". While the editors, in their wisdom, chose to publish the article, one must acknowledge that this statement combines the author's optimistic writing strategy with his limited reading of the literature. The examiners of this PhD thesis correctly point out that the research findings of the study of Digitech share characteristics with previous academic research on knowledge workers at call centres, Taylor and Bain (1999), for example, refer to a call centre as "an assembly line in the head". Particularly in the Chinese context, without using the term "Taylorism", Pun et al. (2016) describe the worker experience at the Foxconn factory as a "semi-militarised labour system" in which workers are under constant control and motivated by monetary incentives. This suggests that the use of information system in the workplace has always played an essential role in impacting on workers' experience at work, and should continue to receive academic

attention. The literature review in the original manuscript submitted to the journal should have connected more tightly with this literature, rather than focusing in detail on the characteristics of original Taylorism. To re-establish this connection, the related literature is reviewed in the introduction chapter of this thesis.

What is really distinctive in this case study is that it demonstrates that, through the use of corporate communication systems, digital management has the power to penetrate non-working life. This is an extension of previous work on the abusive use of information communication technologies at work, such as email (Stich et al., 2017) and WhatsApp (Bisht et al., 2021), that can create pressure at the receiving end of the communication by, for example prolonging working hours. In addition, past studies on call centres suggest that although knowledge work has been highly datafied (no. of calls, calling time, etc.), human managers retain the discretion on how to interpret this data for reward and punishment (Taylor and Bain, 1999). The article demonstrates, however, that the DigiBuy version of "Digital Taylorism" has a diminishing effect on the power of human managerial agency, as algorithms are taking over the role of assessing worthiness for rewards and penalties. Compared to even a few years ago, human managers in this company have far less discretion to interpret the data, not to mention to disprove the digital worker-performance evaluation. As a result, there is extremely fierce competition among workers in every digitally monitored aspect of work (i.e., Key Performance Indicators). The first draft of the manuscript submitted to the journal contained a story that explicitly underpins the competition. This was removed due to the length constraint, but the vignette is powerful: DigiBuy workers must document their progress in a weekly report and circulate it on DigiTalk; project managers have to write a daily report. The intense competition among workers has made the weekly report another battleground, in that workers have been lengthening their reports to show that they have done a lot of tasks over the week. Interviewee Catherine shared her experience with me:

> We used to write the report every week, but now the new policy makes it bi-weekly. The reason is that our senior director thinks the report has become too rigid and superficial. Many people do it by copy-and-paste, and they repeatedly talk about the same tasks for the sake of making it longer. There are a lot of words in the report but no points, that's why it [the policy] was changed.

Another original contribution is made by answering RQ3: How do technology workers experience collective action in China's internet industry, what motivates them, and what inhibits such efforts? The study provides original insight into the rising feminist awareness of women's rights in China by documenting this as a new source of legitimacy for labour activism, while emphasising both theoretical potential and real-world limitations.

Theoretically speaking, this study complements discussions of China's labour activism by presenting a motivation alternative to the predominant social class theory (see, e.g., Hurst and Sorace, 2011; Pun and Koo, 2019), arguing that other than class consciousness, feminism could be a powerful social driver of labour rights development in China. It adds to the existing theoretical debate by demonstrating how social movement unionism could be fully detached with the political force, and how workers can defend their own interests without institutionalising the power through unionisation. Moreover, this study documents in detail the resistance to labour-gender coalitions, both from potential coalition members and from the authorities and broader society. It provides a multi-dimensional understanding of the challenges of labour activism in China and goes beyond a simple 'state's repression' perspective. Lastly, this project theorises about two types of digital surveillance: digital profiling and digital monitoring, as it contributes to more in-depth discussions of fieldwork in authoritarian contexts.

6.3 Revisiting the industrial relations of China's internet industry

Through a set of qualitative research methodologies, this research project has revealed the actual work experience of China's internet workers and explained how it is shaped by institutional and workplace factors. Three government-related factors – state policies that drive the industry's development and competition, state censorship that tempers media-based labour activism on media, and ambiguous judicial decisions on labour disputes that generate uncertainty regarding precedent and legal interpretation – place workers in a disadvantageous position in the tripartite system of industrial relations. Workplace factors, including the implementation of management software and the datafication of work, strengthen managerial control over workers not just "996" (Chapter 2), but 24/7.

In addition, women in particular are exploited in the sexist (and to some extent, misogynistic) cultures that are common in China's internet business environment. Despite unfavourable working conditions, some informants insist their jobs are "good" and "meaningful". This finding provoked the researcher's curiosity: why do China's technology workers tolerate all of the negative components of their jobs? Is it due to the financial rewards and benefits provided by these jobs? (that is, the trade-off is perceived to be "fair"?), or does it represent a lack of labour-rights-consciousness among these workers? (that is, do workers perceive the current trade-off, while unpleasant, to be the best they plausibly can hope for?)

To be sure, tech work comes with some benefits. It is worth recalling that jobs in the internet industry rarely involve heavy physical demands or tasks. This is a non-trivial benefit, considering that industrial accidents in China continue to occur with disturbing regularity (China Labour Bulletin, n.d.; constantly updated), and claim people's lives every single day. Also, tech work hardly ever is of a kind that others find disgusting or disdainful (such as waste picking or toilet cleaning). In fact, as the author observed in the field, Chinese society often imagines jobs in the internet industry as desirable and intriguing, even glamorous. They involve specialised skillsets and workplaces surrounded by digital technologies that are highly valued by many Chinese people today.

Although these characteristics depend very much on organisational culture and management style, in principle at least, the label "internet industry worker" is more likely than not to be greeted with respect and recognition from others, which in turn can help nourish the worker's sense of self-esteem and contribute to a meaningful life. The internet industry also tends to be structured in such a way that some workers gain high levels of financial rewards and benefits (e.g., the "3-6-1" rewards system mentioned in Chapter 3); the researcher was shocked at how many foreign-imported sports cars he saw in the Internet of Things Town in Hangzhou. This means that these workers have the possibility of shaping an enjoyable working life for themselves and their families. On the surface, the internet industry provides a solid basis for good working conditions.

In the following sections, the lens of political economy is used as the author reflects on tech work in China and discusses what the three actors in the industrial relations system –

the state, the employers and the workers – can do to improve the working conditions in China's internet industry, making these jobs more fulfilling to workers.

John Budd (2006; 2012) theorises about the pluralist industrial relations perspective on job quality, which provides an intellectual basis to critically evaluate job quality in China's internet industry. As he proposes, the central objectives of an employment relationship should include three elements: efficiency, equity and voice. From this lens, the main problem of job quality in China's internet industry is an imbalance that privileges efficiency over equity and voice. Therefore, the following discussions focus on how to improve the work experience by improving voice and equity at work.

To start with, one fundamental effort to give voice to workers and defend their rights must be organising unions. The collective support and power that unions provide could be a crucial element for countering the strict managerial control of tech work. As seen in other industries, the difficult conditions and experiences presented in Chapters 2 and 3 would be much less likely to prevail in a situation where strong unions were able to represent workers and negotiate on their behalf. Yet, as described in these chapters, many interviewed technology workers felt uncomfortable when questions regarding the All-China Federation of Trade Unions (ACFTU) were raised. They also were uncertain about whether it is useful to establish a union within their organisation, or felt anxious that associating with labour activism of any kind would lead to losing their jobs.

This phenomenon, however, is not unique to China. It is worth mentioning that unionisation in the internet industry in many countries has been fairly difficult (see, e.g., WORK FOR MORE, 2020; Conger, 2021). For instance, Roy's (2021) study of India's technology industry suggests that technology companies deliberately create numerous managerial and leadership titles, which strengthen the workers' "white-collar" status and prestige. Such 'elitism' in the industry discourages technology workers from participating in labour movements and defending their rights as "workers". In an in-depth study of the videogame industry in the UK, Woodcock (2020) argues that the lack of traditions and rejection of collective organisation remain significant obstacles to organising workers. Woodcock (2019) also observes that the establishment of the trade union movement showed little or no interest in organising these workers, since their profiles did not match those of

traditional union members: these workers are predominantly young, usually have no history of trade unionism, and are engaged in the production of cultural activities (which they passionate about), all of which existing trade unionists struggle to relate to. Besides the factors mentioned above, another obstacle observed in this research project is the highly individualised work environment, discussed in Chapters 3 and 4. For example, workers receive individualised pay and benefits, based on performance assessments that are measured by management software. This leads to competition, creates feelings of isolation in the workplace, and potentially damages the virtue of collective association and solidarity in an organisation and across the industry.

At the current moment, it seems there is little reason to be optimistic about the prospects for unionism in China's internet industry. Over the decades, commentators (e.g., Taylor and Li, 2007; Chen, 2016) have argued that union influence has proved to be limited . Also, the state's quest for technology supremacy has led to high competition between tech companies and an oversupply of graduates, all creating an imbalance of power between dominant employers and vulnerable workers. Despite the important role of China's ACFTU in promoting good employment practices, there is no collective bargaining over pay and working conditions – the heart of trade unionism in the Western context. This is, indeed, part of a broader problem: unionisation and other forms of collective organising in China are becoming increasingly difficult, as the state is strengthening its repression of all aspects of civil society, including labour NGOs and labour activism (see Chapter 5).

In his discussion of the state's role in capitalist development, Michael Burawoy (1983) argues that the production process contains both political and ideological elements, as well as a purely economic moment, and that government plays an essential role in shaping the capital–labour relationship. In his writing, Burawoy (1983: 558) theorises three types of production politics: (1) market despotism, which exists in a form of monopoly capitalism that controls workers through the "economic whip"; (2) hegemonic regimes, which persuade workers to coordinate their with capital and, thereby, control workers through a 'consented' coercion; and (3) hegemonic despots, which bypass or undermine the strictures of the hegemonic regime and compel worker cooperation through the international mobilisation of capital. In his study of the interplay between state interventions and the politics of production in manufacturing, Burawoy (1983: 597) summarises state interventions into two perspectives

that vary for historical reasons: support for the reproduction of labour power, and direct regulation by the state regime. For instance, in the 1980s, the US witnessed low support for the reproduction of labour power but high regulation of the factory regime, whereas the UK experienced the opposite pattern. Hence, labour markets and industrial relations institutions developed differently in the two countries.

Situating the present study into Burawoy's framework, Digitech – an example of a technology enterprise in China – shows similarities with the Japanese model, in which thestate provides little social security with little implementation of workplace regulation. At first glance, it could be argued that the absence of social security and state invention in work conditions in the two countries have a similar impact on workers' experience: both countries are well-known for its long working hours resulting workers' burnout.

However, a follow-up question needs to be asked: what determines the forms of state intervention? Burawoy's answer is, 'while production politics may not have a directly observation presence in the state, they nevertheless set limits on and precipitate interventions of the state' (1983: 596) and 'the direction of determination springs from the substratum of relations of production' (1983: 597). His theorisation, however, is questionable because although the production politics in Japan and China share some similarities (e.g., the reserves of cheap labour, direct entry intro modern industry), fundamental differences exist in the industrial relations system in the two countries. One notable example is the structure of trade union: Despite their constraints, "enterprise unions" in Japan serve a more explicit role in organising workers and negotiating work conditions (Royle and Urano, 2012; Keizer, 2019); whereas Chinese unions primarily serve the interests of the state. Also, grassroot unions exist in Japan (Watanabe, 2018) but not in China. In addition, in his study of the impact of 'Japanese work-organization relations' on the West, Adams (1995: 48) highlights that "Japanese management" is characterised by, for instance, the importance of team responsibility, multiskilling of all team members, and continual systematic pursuit of better quality. These management priorities are not mirrored in China. For instance, in Digitech, the role of workers and their skillsets are highly individualised, and there is an emphasis on productivity over quality in the workplace.

Burawoy's theory fails to explain how these structural differences eventually lead to a similar government approach in the reproduction of labour and regulation in the workplace, and seems to oversimplify the heterogeneity of the model of production in contemporary capitalism. In this regard, this doctoral thesis calls for deeper investigations into the historical development of industrial relations systems and more focussed studies of workers' actual work experience, in order to better understand the role of the state in the political economy of work. Colin Crouch's classic *Industrial Relations and European State Traditions* (1993) provides an important comparative lens to study the role of states and their heterogeneous characteristics in the European context, which could be borrowed to examine the Asian context. This includes, for example, the importance of religion, history, and political philosophy in relation to labour organisation and resistance.

In addition, in Chapter 2, the author shows that ACFTU has literally no place in bargaining for work conditions; this federation does not include a single union that represents technology workers. As revealed during interviews, technology workers in theory can enjoy welfare and benefits that are guaranteed by China's labour laws, but in reality, these laws are rarely enforced. The '996' work schedule, which commonly exists in the tech industry today despite a court finding that it is illegal, is solid proof of this lack of government invention in the workplace. As a response, the author recommends ways the Chinese government could improve the work conditions of technology workers, such as relaxing the competition in the internet industry, enforcing labour policy, and providing more social/digital space for discussion of labour affairs. These measures would address the root cause of labour disputes in the internet industry, but they are unlikely to be implemented unless there is a dramatic shift in the government's policy direction.

While the institutional environment can be expected to remain challenging in the near future, it should not be mistakenly assumed that technology workers will only concur with the policies of their employers: Chapter 4 demonstrates that workers remain militant against sexism and other injustices that exist in the internet industry. The Alibaba case study suggests that other kinds of activisms (e.g., feminist or environmentalist movement) in China can have a synergistic effect with the labour movement. This may provide an alternative ethical basis for technology workers to reflect on their working conditions and motivate them to defend labour rights in the current political climate. On this matter, it should be noted that, like many

roadblocks to unionisation, the phenomenon of sexist culture against women is not unique to China's internet industry. Several journalistic reports (Mundy, 2017; The Economist, 2019) highlight how women meet institutional ceilings in Silicon Valley, and the recent massive protest against workplace sexual harassment and discrimination at videogame producer Activision Blizzard in California illustrates how burning the issue is (WIRED, 2021). In a more positive light, similar experiences can create a common basis for international solidary for future collective actions. In Lin's (2020) commentary on the "anti-996" labour activism in China, he mentions that Western counterparts support Chinese technology workers' endeavours to defend their labour rights.

This thesis further argues that international effort is crucial to improve the working conditions and working experiences in China's internet industry. Consider the case of activism against workplace exploitation in the Foxconn factories in China. Foxconn is a manufacturing group that produces electronics for global brands such as Apple and Samsung. Since 2010, a number of workers committed suicide within the Foxconn campus in the city of Shenzhen, in protest against the highly abusive and exploitative work management in the factories (The Guardian, 2017). These events have drawn the attention of journalists and academics. For example, Pun and her colleagues (Chang and Pun, 2010; Pun et al., 2014; Chan, Selden and Pun, 2020) have written extensively about working life within the Foxconn factories. Increased public awareness, in turn, has triggered a series of protests and demonstrations targeting Apple. The Hong Kong-based NGO *Students and Scholars Against Corporate Misbehavior* (SACOM) organised rallies outside the Apple store in Hong Kong to shame its unethical production practices (see Pun, Tse and Ng, 2019). These actions create enormous pressure on the Apple company to monitor how its products are made and have led to the restructuring of Foxconn factories outside China.

The Foxconn experience could teach a valuable lesson for those contemplating activisms against technology worker exploitation in China. Firstly, more studies should be conducted, to reveal the actual work experiences in these workplaces, including both small and large tech companies, and continuous attention from society is needed. One way to continue this project is to collect data from other technology companies in China's internet industry, in order to understand their management practices. Surveying managers and

employers could be an effective method for revealing the heterogeneity of China's technology company landscape, although some practical challenges can be expected.

Furthermore, based on the 'Decent Work' model promoted by the International Labour Organization, there should be an accreditation programme for employers in the internet industry worldwide, which the employers can sign up if they commit their organisation to the four decent work values: dignity, equality, fair income, and safe working conditions (see ILO, n.d.). Despite arguments by some researchers that the 'Decent Work' framework is theoretically vague and incapable of providing comparative data (Burchell et al., 2014), it is useful to develop a political framework with the potential to regulate the management practice of international tech companies.

This proposed accreditation programme would be voluntary, but accredited companies could display this accreditation on purchasing platforms (Google market, Apple store, Steam, etc.), so that users and consumers know whether or not the software they purchase and use is produced under ethical management practices, including fair pay and equal treatment of workers. The accreditation scheme would also document and openly display court cases or journalist reports related to its member organisations, including the nature of the dispute is, how it is handled, and whether it is settled or not. The accreditation authority could remove accreditation if there is evidence of substantial violations of the Decent Work code. High transparency of information would enable technology workers to look at the situation in other companies and then reflect on their own working conditions, and it is reasonable to predict that accredited tech companies will be more popular among job applicants, which should motivate employers to reconsider their management approach as they strive to retain talent.

6.5 On the future of work

This research project engages directly with wider debates on the impact of digital technology on the future of work. While some focus on the impact of automation on the number of jobs in an industry, others are concerned with changes in labour market macro-factors such as changes in skills or job categories (e.g., Brynjolfsson and McAfee, 2014; Ford, 2015; Frey and Osborne, 2017; Walsh, 2018). While these studies have provoked some important

debates on how digital technology should be used, and on regulation in the workplace setting, their predictions unfortunately fall into the technological determinism trap discussed in Chapter 1: they fail to acknowledge the political economy of technology, and not technology per se, decides what and how digital technology will be implemented.

Therefore, instead of making predictions based on hypothetical scenarios, this study contributes to discussions on the future of work by pointing to the issue of *working conditions*, asking: how can digital technology be used to improve the quality of work for white-collar workers, such as the participants in this research project?

While in Chapter 3 the author reveals some negative work experiences characterised by digital Taylorism, it is also worth noting that the use of digital technology in the workplace has some positive influences on working conditions. For instance, Wood et al. (2019) acknowledge that working in a digital environment governed by algorithms may grant high levels of flexibility, autonomy, task variety and complexity, all of which have been associated with improved worker well-being. In a similar vein, Meijerink and Bondarouk (2021) argue that digital technology simultaneously enables and restrains the autonomy of workers. However, particularly concerning the future of work, the underlying question is: how can these positive qualities be shared fairly by white-collar workers (i.e., knowledge workers) in the labour market and enable them to flourish and achieve meaningful lives?

This thesis is cautious to draw a hasty conclusion because, in principle, each worker can have totally different motivations and desires. While some see work as a means to provide financial stability and economic benefits, others might work for social reasons (e.g., structuring their time, giving life a purpose, meeting future partners) or cultural reasons (e.g., because gender norms pressure men to put food on the table). These motivations and desires are also expected to vary from neoliberal societies to social welfare states. Therefore, simply applying one policy may fail to address the complexity of this issue. However, at a minimum, policy interventions should contain or control the negative impacts of digital technology on work. According to findings presented in this thesis, the most destructive effect on job quality in Digitech is the extensive and, indeed, excessive managerial control over workers' office and personal time. On this basis, arguing from a pluralist industrial relations perspective, it is

important for the government to regulate and reduce working hours in society and, through this measure, reduce the negative influence of workplace technologies on workers' lives.

Recent research by Kamerāde et al. (2019) on the impact of working hours and well-being suggests that working as little as one day (8 hours) per week can provide the same well-being benefits as working 48 hours per week, which implies that working week could be radically reduced to make room for other social activities. In Western countries including the UK, more and more technology companies, such as Microsoft, are adopting a four-day workweek and feedback regarding the quality of working life is generally positive (Paul, 2019). Moreover, commentators (Murphy and Terry, 2022) are campaigning for the "right to disconnect" (Eurofound, 2021) – which means workers can choose not to respond to their colleagues and managers during non-work hours. European countries such as Belgium, France and Portugal have even passed laws that ban employers from contacting workers during non-work hours (see, e.g., Bateman, 2022). These policy interventions enable workers to retain their autonomy, which is a crucial prerequisite for an improved their quality of working life. However, the extent to which the government and employers in China are open to policies like these is yet to be investigated. Domestic and international effort – from academics, to activists, to ordinary workers – will be vital to such advocacy, and understanding these dynamics is a significant new direction for future research.

Last but not least, despite the stress of the pluralist industrial relations model on the importance of institutions, some problems of working conditions can be only partly solved by the tripartite actions of government, employers and unions. As demonstrated here, many Chinese technology workers work extremely hard, for long hours, in the expectation of gaining considerable financial benefits from their jobs. In this regard, self-management can turn into self-exploitation, where workers drive themselves harder and harder in order to achieve excellence, further status and perhaps even to live the (perhaps imagined) bohemian lifestyle they aspire to, and which the internet industry promises to provide. However, individuals must realise that making commitments to work over the well-being of others comes at a cost. As presented in Chapter 3, some interviewed programmers have already internalised the abusive nature of their jobs and have come to see exploitation as part and parcel of their occupation and identity as technology workers, therefore a new *work ethic* is needed for Chinese tech professionals, in order to improve the collective work experience.

This will not be easy; Budd and Scoville (2005) argue that work ethics have long been one of the blind spots in both the scholarship and practice of industrial relations, and this is research gap deserves future academic attention.

From an industrial relations perspective, “self-exploitation” is a misnomer. The seemingly individual decisions made by technology workers are partly the result of the political economy in an internet industry that shapes values about how best to develop careers and live lives. Also, there remains a crucial difference between technology workers, who are closely supervised and monitored through digital management software, and other professionals whose strong commitment to hard work is compensated with relatively high autonomy. Although, at one level, individuals make the choices about the degree to which they commit themselves to work, in reality there are no other options, given the high competition and fast work pace of work characterised by the datafication of work and digital Taylorsim.

Future research could determine more precisely the extent to which research findings presented in this thesis can be generalised to technology workers in other sizeable Chinese internet companies. Moreover, this thesis argues that we need to critically examine tech work, and to recognise that firms and other institutional differences in terms of what kinds of conditions and experiences they make available for their employees, including how are they rewarded and managed. For instance, the working conditions in the sizeable internet company studied in this research project are found to be different from those in smaller tech firms (see, e.g., Sun and Magasic, 2016). This suggests that there is a significant issue of inequality and, in relation to tech work, potentially related to the nature of the internet business, geographical location, relationships with governments, and so on, all of which are beyond the scope of this project, but should be the objects of future research. Another limitation of the study is that it does not take workers’ personal background into the analysis. As the internet workforce of China is highly heterogeneous, composites workers from different socio-economic background, their status could have a significant impact on how they perceive the role of government and their work satisfactions. Reflecting on the methodological limitations of this research, quantitative data collection (i.e., a survey) conducted prior to the interviews and observations, might have enriched the socio-economic understanding of technology workers in China. Also, this study only analyses those who are

in the junior to mid-level position, and left out those who are in senior and leadership positions. Therefore, this study might not be able to fully represent the complexity of internet business in China in reality. More effort could have made to liaise with senior technology workers, possibly by participating in industry events, in order to gain a more comprehensive understanding of the management practices in China's internet industry.

This thesis demonstrates that jobs in China's internet industry provide some great elements of quality jobs, as well as some negative elements. The most pressing issue for a political economy of technology is not how to boost the efficiency, productivity or economy, which are the current aims of the Chinese government's policies, but how to make working conditions better and improve work experiences. The future of work should not be just a matter of whether or not there will be enough jobs for everyone; it is also related to the quality and the distribution of these jobs. Arguing from a pluralist industrial relations perspective, this thesis contends that institutional changes are as important as individual changes, because, as the research findings indicate, employers and workers can always make new ways to bypass regulations, and policy interventions will be not successful without the support of individual workers. To achieve the implementation of digital technology in ways that can improve the quality of work, both individual and collective efforts are equally important. This doctoral thesis hopes to serve as a beacon, to illuminate the quest for labour rights construction in China's internet industry, and the author commits his future work to this mission.

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Appendix I What industrial relations research has contributed to the new technology and work debate? A scoping review of the literature with recommendations

It is unusual for a PhD thesis to contain a scoping review; in most cases, a literature review chapter should explain the theoretical background and motivations (which are presented in Chapter 1), and should present and comment on the current debates of a particular topic. However, because this thesis is a collection of articles published in peer-reviewed, international journals, each substantive article (i.e., Chapters 2, 3, 4 and 5) contains its own literature review section, which elaborates the intellectual tradition and debates of interest to the specific questions addressed. Therefore, to prevent an excessive repetition of content, this review takes the form a scoping review of the literature, and examines the contributions of industrial relations research has to debates surrounding the relationships between new technology and work, identifies common themes, and highlights the existing research gaps.

A scoping review is "a type of research synthesis that aims to map the literature on a particular topic or research area and provide an opportunity to identify key concepts; gaps in the research; and types and sources of evidence to inform practice, policymaking and research" (Daudt *et al.*, 2013). It is a rapid, rigorous and transparent method for mapping areas of research, and can be used as a stand-alone project or as a preliminary step toward a systematic review (Arksey and O'Malley, 2005). Unlike systemic reviews, a scoping review is not intended to review articles meticulously or to summarise the literature while addressing a specific research question. Therefore, the quality (i.e., number of citations, impact factor) and details of articles engaged with here will not be assessed.

This doctoral thesis chooses to conduct a scoping review over a systemic review because of some practical constraints: To avoid subjective bias when reviewing the quality of an article, a systemic review is usually conducted by a research group with specialised skills, of which at least two reviewers work independently (Munn *et al.*, 2018), which is not possible here.

As a research method, scoping reviews do not aim to produce a critically appraised and synthesised result associated with a particular research question. The contribution of this review is its identification of research gaps in the scholarship of industrial relations and, therefore, the additional grounds it provides for the pursuit of this doctoral research project.

Abstract

The implementation of Fourth Industrial Revolution technology in the workplace has profound impacts on work experiences and labour markets, but our empirical understanding of these technologies remains insufficient. ***Purpose:*** *This article re-examines what contemporary industrial relations research has contributed to the debate about new technology and work by presenting the results of a scoping review of the relevant literature.* ***Design/methodology/approach****: Adopting the PRISMA 2020 framework, a scoping review was conducted in twelve selected journals and one academic database.* ***Findings:*** *Results indicate that while some studies have investigated the impacts of relevant technologies, attention was distributed unevenly across different geographic regions and job qualities.* ***Originality/value:*** *This review provides a general description of the current empirical knowledge, identifies gaps in knowledge and offers five recommendations for future research.*

Keywords Fourth Industrial Revolution, industrial relations, new technology, scoping review, empirical study

1. Introduction and context

Industry watchers since 2015 have argued that a Fourth Industrial Revolution (4IR) has begun. New digital technologies like artificial intelligence and advanced robotics are already having a profound impact on economies and societies, and the depth and breadth of their impacts are growing rapidly (Schwab, 2017). While some writers (e.g., Moll, 2022) question whether this technological transformation rises to the level of a 'revolution', there is no doubt that "4IR" has become something of a buzzword in policy documents around the world: Germany has its "Industrie 4.0" and the idea of "Making Indonesia 4.0" is wildly popular in Jakarta (Speringer and Schnelzer, 2019). This article proposes to explore the state of our understanding of 4IR impacts on labour markets and the working experience. I argue that, when it comes to concrete empirical knowledge, researchers in these areas have more questions than answers.

Commenters have noted that new technology has been transforming jobs in conventional employment settings, for example, the use of algorithms in managing warehouse workers (Wood, 2021). Studies on the technological impact on work, however, are disproportionally dominated by platform work. To help rectify this imbalance, this article intends to synthesise the disparate findings of studying the empirical impact of work in conventional employment settings as a result of the implementation of new technology. Current research trends will be identified and limitations of the existing literature will be highlighted.

Indeed, the extent to which industrial relations (IR) scholarship has contributed to discussions about new technology and work is a highly debatable topic. In their presentation at the Centre for Employment Relations, Innovation and Change (CERIC) Spring 2021 Webinar Series, Simon Joyce and Mark Stuart argued that contemporary industrial relations research has contributed little to debates about new technology and work. This provocative claim inspired the current article, which makes a distinctive contribution by reviewing the existing empirical literature on how new digital technology has affected issues associated with conventional employment. As Halteh et al. (2018: 210) point out, "much of the literature around new technology and employment is speculative or based on abstract modelling methods that may or may not capture developments in the real world"; therefore, the

empirical focus in this review, and scholars who pursue its recommended lines of inquiry, can complement the economic models and improve the scientific quality of IR research.

At the broadest level, the 4IR repertoire includes a number of advanced digital technologies such as robotics, sensors, artificial intelligence (AI), big data, cloud computing, virtual reality, augmented reality and additive manufacturing (i.e., 3D-printing) (see Rainnie and Dean, 2019). However, this article looks at digital innovations that more directly define the 'personality' of 4IR, most notably artificial intelligence, algorithms, and advanced robotics. This survey demonstrates that while some studies have been conducted to investigate the impacts of these technologies on work, attention is overwhelmingly West-centred and manufacturing- (rather than service- or knowledge-) oriented.

1.1 Significance of review

While the literature review is a research method commonly used by academics, as well as by governments and research institutes for policy advocacy purposes, only a few existing review papers have touched on the impact of new technology on work and employment. To the author's knowledge, none have focused on examining the empirical evidence of the impact of the implementation of new technology in the workplace, which is the original contribution of this review.

Balliester and Elsheikhi's (2018) search of four databases for the period 2005–2017 yielded 255 studies related to the future of work, analysis of which yielded five key themes: the future of jobs; their quality; wage and income inequality; social protection systems; and social dialogue and industrial relations. While they provide a comprehensive analysis of the impact of technology on the labour market, an update is certainly needed as the digital revolution has picked up steam since 2018. Discussions on how new technologies are implemented in the workplace are also missing.

Meanwhile, Parry and Battista's (2019) literature review presents evidence relating to the impact of new technology on human resource (HR) management. Following a review of 51 documents published between 2010 and 2018, including both academic and grey literature (research undertaken by consultancies and similar bodies), they conclude that the HR

function has a key role to play in helping employees to navigate the changes in the world of work, particularly in relation to skills development, work organisation, and mental health (p. 6). Their work focuses on identifying ways HR specialists can engage with workers who have been adversely affected by the introduction of new technologies, whereas the current review has a greater interest in the nature of those effects, both positive and negative.

Kaine and Josserand (2019) systemically review the literature on work experiences in the platform economy. Their review of journal articles and review papers (119) and conference papers (21) published between 2009 and 2019 identifies several key themes, such as conditions for gig workers, the impact of gig work on workers through how they experience their work, and the impacts of information and technology on gig work. Their work provides an excellent picture of the literature on gig work and will not be replicated here. However, gig economy platforms constitute only one to three per cent of total employment (before the COVID-19 pandemic) in OECD (Organisation for Economic Co-operation and Development) member countries (Schwellnus, et al., 2019) and a similar proportion in developing countries such as China (Feng, 2022). This leaves a wide-open field of questions related to how other kinds of jobs (e.g., jobs with a contract) in the labour market are impacted by new technologies.

The structure of this article is as follows: first, the PRISMA 2020 framework of systematic reviews (Page *et al.*, 2020) will be introduced, including a discussion of data sources, search strategy and eligibility criteria. Next, descriptive and methodological characteristics of the reviewed studies will be presented. Lastly, the review proper will provide a synthesis of the major research themes and findings, leading to five specific recommendations about directions for further research.

2. Methods

In order to critically and systematically review the literature on the impact of new technology on industrial relations, a scoping review method was adopted to determine "the extent, range, and nature of research activity" (Arkesy and O'Malley, 2005, p. 21). Specifically, the PRISMA 2020 framework transparently sets out "why the review was done, what the authors did, and what they found." (Page *et al.*, 2020, p. 1) This scoping review was conducted in the

following steps: identify the research questions, identify the relevant studies, select the studies to be included, chart the data, and finally collect, summarise, and report the results. Scoping reviews "share the characteristics of the systematic review in attempting to be systematic, transparent and replicable" (Grant and Booth, 2009) but, unlike systematic reviews, the scoping review method does not filter studies on the basis of research design and thus can address broader topics where many different study designs might be applicable (Dijikers, 2015).

The scoping review method has been chosen for two reasons. First, it is an efficient and effective way to map fields of study where a range of material is available. As IR in the 21st century involves the interdisciplinary study of "the employment relationship and all the behaviours, outcomes, practices, and institutions that emanate from or impinge on the relationship" (Kaufman, 2004, p. 45), this review will synthesise the disparate findings of studies on the impact of new technologies on work across IR, including sociology, technology and society studies (STS) and work and employment studies, instead of focusing on understanding a specific aspect of technological power or a phenomenon.

Secondly, a scoping method is a particularly useful way to identify research gaps in the existing literature, and enables the author to engage in debates on what contemporary industrial relations studies have – and have not – contributed to our understanding of the relationships between new technology and work.

2.1 Research questions, data sources, search strategy, and eligibility criteria

The primary research question for this scoping review is: What is known from the existing academic literature about the empirical impacts of new technology on work and employment? The secondary research question is: What is not known, that is, what knowledge gap(s) exist regarding the primary research question, and how can scholars fill them?

In order to address these questions, a Boolean search was conducted on the archives of thirteen selected journals: *British Journal of Industrial Relations, Industrial Relations Journal, ILR Review, Employee Relations, European Journal of Industrial Relations, Journal*

of Industrial Relations, *New Technology, Work and Employment*, *Industrial Relations: A Journal of Economy and Society*, *Work, Employment and Society*, *Work and Occupations*, *Economic and Industrial Democracy*, *The Economic and Labour Relations Review*, and *International Labour Review*. The same search was performed in the *Sociological Abstracts* database, which covers sociology and behavioural sciences literature that has been published Europe, Australia and North America. Within the limitations associated with resources, funding and journal access, the widest possible range of journals were selected to ensure a degree of representativeness in this review. All of these are peer-reviewed, English-language, published since 2016 (the year when the World Economic Forum officially launched the 4IR concept), and include links to full-text articles.

Attention was next directed to the question of which subject matter should be reviewed. Scholars disagree about how to define and bound the "new technologies" to be included in studies of the "next wave" of technological impact on the workplace. Leslie Willcocks (quoted in Briône, 2017) foresees nine key types of technology that are crucial to workplace changes in coming years: social media, mobile analytics, artificial intelligence, cloud computing, blockchain, robotics, automation of knowledge work, Internet of Things and digital fabrication; Brougham and Harr (2017; 2018) propose the STARA framework – Smart Technology, Artificial Intelligence, Robotics and Algorithms); others look at artificial intelligence, robotics and automation technologies (Coombs et al., 2017; Alcover et al., 2021), or artificial intelligence, robotics and advance technologies (Vrontis et al., 2022). The current study extracted the common factors from the literature: hence, "artificial intelligence", "robotic" and "algorithm" were used as Boolean search keywords. The keywords "work", "employment" and "job" were used in order to exclude articles that are purely technical and not related to IR studies in the broadest sense. The Boolean search reads as follows:

Artificial intelligence OR robotic OR algorithm,
AND work OR employment OR job

This precisely-defined keyword search generated a list of 317 articles, whose abstracts then were scanned for relevance. Non-research articles such as book reviews and commentaries were removed. Substantively, purely theoretical papers were excluded, as were

articles that analysed employment in non-conventional settings like platform work and domestic work. After filtering, 54 articles remained for full article review. A surprising finding at this stage of the process is that, to date, more studies have focused on non-conventional (that is, gig work) than conventional settings. Once these were removed, 23 articles were left for data extraction and analysis.

2.2 Data extraction

Data was extracted and incorporated into three excel spreadsheets, which are presented below as Tables I, II, and III. Table I contains descriptive and methodological characteristics of each study, including author(s)' name(s), publication year, geographic area of interest, research method (quantitative, qualitative, or mixed), and research sample size and demographic characteristics. Table II summarises the main research objective(s) and key finding(s) of the study, and Table III includes extracted quotes and statements describing the conceptualisation of new technology and its impact on work or labour markets.

3. Results

3.1 Descriptive and methodological characteristics

Table I presents the descriptive and methodological characteristics of each study. As shown, 16 out of the 23 articles were extracted from seven industrial relations journals, three were extracted from work and employment studies journals (*Work, Employment and Society* and *Work and Occupations*), one from an STS-focussed journal (*Technological Forecasting & Social Change*), and three from other sociology journals (*Sociology of Health and Illness*, *Theory and Society*, *Theory Culture & Society*). Two journals in the initial scoping list did not contain any articles that matched the search criteria (*British Journal of Industrial Relations*, and *European Journal of Industrial Relations*).

Table I. Descriptive and methodological characteristics of each study

Author(s), year	Journal	Location(s)	Methodology(ies)
Bailey *et al.*, 2020	*Current Sociology Monograph*	England, the UK	Qualitative (ethnography and interviews)
Beverungen and Lange, 2018	*Theory Culture & Society*	New York and Chicago, US	Qualitative (ethnography and interviews)
Brougham and Haar, 2017	*Labour & Industry: a Journal of the social and economic relations of work*	New Zealand	Quantitative (survey)
Carneiro and Costa, 2020	*Journal of Industrial Relations*	Brazil, Canada, Portugal and the UK	Qualitative (content analysis)
Chigbu and Nekhwevha, 2020	*Economic and Industrial Democracy*	South Africa	Qualitative (in-depth interviews)
Evans and Kitchin, 2018	*New Technology, Work and Employment*	Ireland	Qualitative (ethnography and interviews)
Flanagan and Walker, 2020	*New Technology, Work and Employment*	Australia	Qualitative (semi-structured interviews)
Gekara and Nguyen, 2018	*New Technology, Work and Employment*	Melbourne and Sydney, Australia	Qualitative (formal interviews and informal discussion)
Haipeter, 2020	*Industrial Relations Journal*	Germany	Qualitative (Case studies of workplaces and interviews)
Hodder and Houghton, 2019	*New Technology, Work and Employment*	the UK	Quantitative (content analysis)
Krzywdzinski, 2017	*New Technology, Work and Employment*	Germany, Poland, Czech Republic, Slovakia and Hungary	Mix methods (quantitative survey and qualitative case case)
Lima *et al.*, 2021	*Employee Relations*	Brazil	Quantitative (secondary data analysis)
Lloyd and Payne, 2019	*New Technology, Work and Employment*	The UK and Norway	Qualitative (face-to-face interviews)
Lloyd and Payne, 2021	*Industrial Relations*	Scotland and Norway	Qualitative (semi-structured, face-to-face interviews)
Menchik, 2020	*Work and Occupations*	United States	Qualitative (content analysis and in-depth interviews)
Nam, 2019	*Technological Forecasting & Social Change*	US	Quantitative (secondary data analysis)
Schwennesen, 2019	*Sociology of Health and Illness*	Denmark	Qualitative (ethnography and interviews)
Shestakofsky, 2017	*Work and Occupations*	San Francisco and Las Vegas, US and the Philippines	Qualitative (participant-observation research, informal interviews)
Skrbisš and Laughland-Booÿ, 2019	*New Technology, Work and Employment*	Australia	Mixed methods (longitudinal survey and semi-structured interviews)
Stroud and Weinel, 2020	*New Technology, Work and Employment*	Italy and Germany	Qualitative (interviews)
Terry *et al.*, 2021	*Work, Employment and Society*	North of England, the central belt of Scotland, the UK	Qualitative (semi-structured interviews)
Ubalde and Alarcón, 2020	*The Economic and Labour Relations Review*	US	Quantitative (secondary data analysis)
Waring, Bali & Vas, 2020	*The Economic and Labour Relations Review*	Singapore	Quantitative (survey)

3.1.1 Context and geographical location

In terms of research context, 17 of the 23 articles were single-country studies, while the remaining six involved cross-national comparisons. Twenty of the studies were

contextualised entirely in the global north, with only three featuring data from and analysis of countries in the global south (the Philippines and Brazil).

3.1.2 Research methods

Sixteen studies applied qualitative research methods. Semi-structured interviews, in-depth interviews, and open-ended interviews were the most common qualitative approaches. Other qualitative methods used by researchers include content analysis (Carneiro and Costa, 2020), workplace ethnography (Bailey *et al.*,2020) and informal interviews (Shestakofsky, 2017).

Five of the studies are based entirely on quantitative methods, including surveys (Brougham and Haar, 2017; Waring, Bali and Vas, 2020) and secondary data analysis (Nam, 2019; Ubalde and Alarcón, 2020; Lima *et al.*, 2021). Only two studies utilised mixed methods approaches: Skrbisš and Laughland-Booÿ (2019) combines semi-structured interviews with data from a longitudinal study of young people from Queensland, Australia; and Krzywdzinski's (2017) comparison of labour-use strategies between Germany and countries in Central Eastern Europe includes both a survey of employee representatives and qualitative case studies of selected companies.

3.1.3 Sample size and other demographic characteristics

The sample size of the quantitative studies varied considerably. For example, the secondary data analysis by Ubalde and Alarcón (2020) contains a relatively large sample from the US labour market (n=37,080). The secondary data analysis by Nam (2019) sampled 2000 people, a medium-size dataset. Primary analyses were based on surveys ranged from n=196 to n=332.

The sample size for qualitative studies varied from small (Flanagan and Walker, 2020, interviews n=7) to medium (Wu *et al.*, 2019, interviews n=120). In addition, most qualitative research included few demographic details of their subjects; an exception is Terry *et al.* (2021), which details participant age, nationality and gender. Some quantitative and mix-method studies treated demographic characteristics as variables in their analysis (e.g.,

Brougham and Haar 2017, on employees' assessment of technological redundancy in New Zealand).

3.2 Four conceptualisations of "new technology"

Eleven studies conducted macro-analyses of the impact of the new technology on societal institutions or industries, broadly defined (e.g., unions). The other 12 articles examined the impact of new technology through micro-industrial relations analyses of, for example, workplace-based employment issues and the operation of the labour process. (See Taylor, Kai and Qi, 2004, p. 3 for definitions of macro- and micro-analysis.)

The ways in which new technology affects work or labour markets were conceptualised in four ways, and some studies looked at more than one aspect. Most studies (*n*=15) looked at how the labour process is affected by automation. The less common themes were the power of disruption (*n*=6), interactivity and connectivity (*n*=3), and control and monitoring (*n*=2). Table II shows how new technology is conceptualised in these studies.

Table II. How new technology is conceptualised in each study

Author(s), year	Automation	Disruption	Interactivity and connectivity	Control and monitoring
Bailey *et al.*, 2020	X	X		
Beverungen and Lange, 2018	X			
Brougham and Haar, 2017	X			
Carneiro and Costa, 2020			X	
Chigbu and Nekhwevha, 2020	X			
Evans and Kitchin, 2018				X
Flanagan and Walker, 2020	X		X	
Gekara and Nguyen, 2018	X			
Haipeter, 2020	X	X		
Hodder and Houghton, 2019			X	
Krzywdzinski, 2017	X			
Lima *et al.*, 2021	X			
Lloyd and Payne, 2019	X	X		
Lloyd and Payne, 2021	X			
Menchik, 2020		X		
Nam, 2019		X		
Schwennesen, 2019	X			
Shestakofsky, 2017	X			
Skrbisš and Laughland-Booÿ, 2019		X		
Stroud and Weinel, 2020		X		
Terry *et al.*, 2021	X	X		X
Ubalde and Alarcón, 2020		X		
Waring, Bali & Vas, 2020	X	X		

3.2.1 Concept 1: automation

The majority of studies conceptualised new technology as an intelligent machine for automation. That is, they explored phenomena related to the idea that technology is implemented for the purpose of reducing the role of humans in labour processes. For example, Chigbu and Nekhwevha (2020) focus on how job automation by robotics has changed work experiences in South Africa's automobile sector. They demonstrate that "the implementation of robotics has increased in the sector to dominate and automate many tasks previously assigned to autoworkers" (p. 18). Beyond the manufacturing industry, some studies addressed automation in the context of "knowledge work". For example, Bailey *et al.* (2020) assess the impact of an algorithm that automates the identification of acute kidney injury on workflow in two National Health Service hospitals in England.

3.2.2 Concept 2: Disruption

Disruption refers to changes in the tasks performed by human labour without reducing the demand for human labour. This might follow from the introduction of new automation technologies, but might also arise from new technologies that enable the performance of tasks that had been impossible. For instance, Menchik (2020) details how the robotic technology 'Stereotaxis' allows physicians to treat arrhythmias (a heart condition) through a more efficient operation. While the physician remains essential for conducting the procedure, the operator can use a mouse or a joystick to perform the surgery, instead of the traditional manual ablation. In a different context, Stroud and Weinel (2020) conclude that drones used in the European steel industry have led to "safer, faster and leaner" workplaces (p. 312); while "leaner" might imply "labour-saving", interviewed steel industry workers have a separate reason for optimism, as will be discussed below.

3.2.3 Concept 3: Interactivity and connectivity

While the impact of information communication technologies (ICTs) on work has been well-researched over the last two decades, ICTs that incorporate new technologies are increasingly interactive with and connected to humans. Hodder and Houghton (2019), for instance, show that union engagements with young workers on social media from 2014 to 2016 frequently and actively used likes, retweets and hashtags in their "campaigning, external campaigning and news" efforts (pp. 55–56). Similarly, Flanagan and Walker (2020) show how the use of

an AI-enabled chatbot by a traditional union in Australia strengthened their communication and organisation with workers.

3.2.4 Concept 4: Control and monitoring

"Control and monitoring" technologies have changed the ways workers are managed. This is done by datafying workers' performance in the workplace, or automating the management process through algorithms (often seen in platform work). Terry *et al.* (2021) describe how a home credit company manages its agents through a smartphone app that is designed to ensure that agent practices are in line with government requirements. They discovered that this algorithmic control significantly limits agent autonomy over lending decisions (p. 10), and potentially threatens customer relations. Meanwhile, Evans and Kitchin (2018) investigated the use of Big Data systems in retail stores, finding that the technology "created worker dissatisfaction in a number of ways, such as symbolic labour being undervalued" and "in particular, there was a sense amongst workers that they operate as cogs within a machine rather than providing a service for customers" (p. 55).

3.3 Research objective(s) and key finding(s)

The 23 articles can be categorised into four types according to their research objectives. Most of the articles (*n*=12) can be called "implementation studies", which aim to provide a detailed description of how new technology is implemented in the workplace and how it affects workers or redefines relations among humans at work. Articles of the second type (*n*=5) are "perception studies" that, rather than studying the actual experience of adopting new technology at work, instead investigated how stakeholders (such as employers, unionists or programmers) perceived the impact of new technologies on the labour market or in the workplace. Another four articles are categorised as "union studies" that seek to understand how unions make use of new technology to address real-world labour issues. Two articles do not fit any of these categories and are analysed separately. Table III outlines the four main types of research objectives that were present in the studies under investigation.

Table III. Main research objective(s) of the studies

Author(s), year	Implementation study	Perception study	Union study	Others
Bailey *et al.*, 2020	X			
Beverungen and Lange, 2018	X			
Brougham and Haar, 2017		X		
Carneiro and Costa, 2020			X	
Chigbu and Nekhwevha, 2020	X			
Evans and Kitchin, 2018	X			
Flanagan and Walker, 2020			X	
Gekara and Nguyen, 2018	X			
Haipeter, 2020			X	
Hodder and Houghton, 2019			X	
Krzywdzinski, 2017	X			
Lima *et al.*, 2021				X
Lloyd and Payne, 2019	X			
Lloyd and Payne, 2021		X		
Menchik, 2020	X			
Nam, 2019		X		
Schwennesen, 2019	X			
Shestakofsky, 2017	X			
Skrbisš and Laughland-Booÿ, 2019		X		
Stroud and Weinel, 2020	X			
Terry *et al.*, 2021	X			
Ubalde and Alarcón, 2020				X
Waring, Bali & Vas, 2020		X		

3.3.1 Type 1: Implementation studies

While labour replacement is the main motivation for the implementation of new technology (and especially algorithms and robotics) in the workplace, many studies found that humans remain highly relevant, if not critical, to the production process.

Bailey *et al.*'s (2020) ethnographic research in two hospitals shows that embedding algorithmic technologies necessitated human work, and that algorithms do not reduce the need for humans organise informal work such as ward-based meetings. However, they also found that algorithm-based decision-making might be problematic when it interrupts and directs human decision-making. Their research echoes Lloyd and Payne's (2021) finding that the introduction of an automated guided vehicle (AGV) in public hospitals had a limited effect on both the number of jobs made redundant and the variety of new tasks and skill requirements that emerged. They conclude that "the AGV systems are anything but 'smart' or 'autonomous', requiring continual human oversight and intervention." As a result, future investment in AGVs is likely to be constrained (*Ibid.*). In a similar vein, Schwennesen's (2019) findings suggest that, rather than an autonomous system that possesses agency or

authority, the algorithmic system used by Danish physiotherapists in physical rehabilitation programmes is a collective creation that followed negotiations between IT workers, patients and health care professionals.

In another workplace ethnography, Shestakofsky (2017) reveals two forms of human–software complementarity in which humans remain essential: computational labour that supports or stands in for software algorithms, and emotional labour that helps users adapt to software systems. Emotional labour is also mentioned in Terry *et al.*'s (2021) study of home credit agents: particular work activities – namely, those necessitate the interpretation of complex feeling rules through tacit human judgement – are largely incompatible with algorithmic logics and therefore present challenges that digital managerial control systems generally fail to overcome.

Indeed, the tension between two values, discretion and autonomy, is another key feature that scholars of 4IR impacts have honed in on. For instance, in their study of high-frequency trading (HFT) practitioners, Beverungen and Lange (2018) show that traders are not merely a passive part of a system that was designed by others; through their algorithms, they actively co-construct financial markets. The scholars thus argue that HFT provides a specific view of the technological unconscious, in that the tasks and the costs of consciousness are immediately apparent and critical to the success of traders. Evans and Kitchin (2018) find that retail work involves continual movement between a governance regime of control reliant on Big Data systems, which seek to regulate and harness formal labour and automation into enterprise planning, and a disciplinary regime that deals with the symbolic, interactive labour that workers perform. However, they find that control of workers through a Big Data system is highly precarious, fallible, and exacerbates worker dissatisfaction in several ways. Similarly, in his research on physicians' use of robotic technologies, Menchik (2020) explains how physicians share a variety of concerns about professional monopolies over power, workplace incentives, or patient relationships.

Three articles evaluate the impact of new technology on skills. Gekara and Nguyen (2018) conclude that a completely different type of port terminal workers, with different job roles and skill profiles, has emerged after the implementation of robotic technology in Australian container terminals. Unlike traditional workers, new terminal workers are well-educated and highly computer literate. Furthermore, as physical shop floor operations are

computerised and automated, greater importance is placed on soft, generic and transferable skills, with increasing emphasis on computer skills, which facilitate effective work within a highly mechanised and digitalised work environment. Another optimistic account is provided in Stroud and Weinel's (2020) study of technical-maintenance workers who believe they can deploy new drone technology to their benefit. These skilled steel industry workers believe the deskilling effect of the new technology will be balanced by the need for technology-induced upskilling, so overall they don't see themselves as victims of technological development. Krzywdzinski's (2017) investigation of high-tech manufacturing in the automotive industry also makes note of changing skill requirements on the shop floor after new technology is introduced. However, his analysis shows that labour-use strategies depend less on the new process technologies per se, but rather on the institutional framework and the role of the factory management in introducing new products and new process technologies.

Lastly, research by Chigbu and Nekhwevha (2020) details labour–management conflicts that can arise in association with the implementation of new technology. Management views the output of particular automated tasks in the motor manufacturing sector as both of higher quality and lower cost than humans had accomplished. Indeed, the number of manufacturing tasks with these characteristics has expanded to the point where the shop floors of automobile factories are dominated by robots, which suggests that South Africa's automobile labour process might have thwarted job creation and accelerated job insecurity, two widely expected outcomes in the 4IR era (e.g., Frey and Osborne, 2017; Susskind, 2020).

3.3.2 Type 2: Perception studies

Five sets of scholars ask about how people perceive the impact of new technology on themselves or the labour market. Nam's (2019) secondary data analysis shows that US employees' perception of job insecurity is highly associated with technology usage and long-term perceptions of job and work prospects. Skrbisš and Laughland-Booÿ (2019) found that 51 interviewed Australian youths remain confident about their career prospects despite 4IR, as they believe in their ability to adapt to the rapidly changing work environment. Brougham and Haar's (2017) survey of employees in New Zealand (n=196) shows that workers see job control, repetition and job complexity as key predictors of the probability of labour redundancy: for instance, jobs that are more complex are less likely to be replaced by new

technologies. Waring, Bali and Vas's (2020) survey research suggests that the concerted policy efforts by the Singaporean government to drive economic growth were not matched by a similar level of industry readiness. For instance, their respondents believed that the majority of employers in Singapore were not clear about the benefits of AI-related technologies.

In this category, only one study adopted a comparative approach: Lloyd and Payne (2019) interviewed 37 experts and AI developers in the UK and Norway and found that, in terms of the development of new technology, UK-based interviewees believed that the UK has some advantages, including a critical mass of university-based researchers who build upon an already strong science base. However, they had not observed that the UK's perceived development edge has been matched with early workplace adoption of new technologies. On the other hand, interviewees in Norway perceived that their country places a greater focus on diffusion, supported by a more stable and longer-term approach to policymaking and the influence of other stakeholders, particularly employer organisations and trade unions. Government and state institutions also were perceived to be more prominent as drivers in the public sector.

3.3.3 Type 3: Union studies

Three of the four studies in this category look at how unions take advantage of the new technology. Flanagan and Walker (2020) reveal that an app called "chatbot" has become an infrastructural resource that enables otherwise marginal workers to receive basic information in a manner that reinforces union narratives of power and worker solidarity; chatbot also facilitates the efficient collection of workplace information by unions. They found that the technology did not act as a labour-saving tool; on the contrary, it stimulated wide-ranging learning by bringing implicit tensions between 'servicing' and 'organising' conceptions of knowledge, power and expertise to the surface, thereby enabling union organisers to perform tasks that had not been attempted previously. Chatbot thus enhances union resources and capabilities as 'orchestrators' of worker power. Hodder and Houghton (2019) find similarities between the GMB Union, the Public and Commercial Services Union, and Unite the Union in terms of message content and focus, and that the youth sections of unions are more involved with the interactive capabilities of Web 2.0 than the existing literature had suggested. In another study of union social media accounts, however, Carneiro and Costa (2020) find that

the focus on disseminating their own content and a few tags on social media indicates that connections with other organisations or people are occasional and restricted to an immediate sphere of influence, thus reinforcing the "echo chambers" of the confederations and hindering possibilities for outreach and alliance-building. Also, they argue that even if confederations position themselves at the forefront of technological developments that might help advance the cause of trade unionism, they use the new technologies to reproduce an outdated "one-way" model of communication, such as Facebook, mostly to relay information rather than taking advantage of social media's many interactive opportunities for horizontal dialogue.

Finally, a study by Haipeter (2020) reveals how unions respond to the threat of digitalisation in the workplace. They show that German unions in the manufacturing sector have developed a new strategy to strengthen the resources and capabilities of plant-level worker representatives, who now can link themselves with works councils. As a result, workers can play a more active role in managing the technological changes in the workplace.

3.3.4 Type 4: Others

It is argued that new technologies and automation will increase the demand and reward for highly skilled jobs, while making low-skilled jobs redundant, and a secondary data correlational analysis by Ubalde and Alarcón (2020) shows that, while what they call "hard verbal-reasoning skills" are associated with high average salaries, as is predicted by neoclassical theory, people with interactive and multilingual language skills are unrewarded and even penalised.

Finally, by applying Frey and Osborne's (2017) computerisation probability equation into the Brazilian context, Lima *et al.* (2021) argue that automation and computerisation will have a significant impact on Brazil's labour market in the future and worsen the unemployment problem.

4. Discussion

The survey above provides a glimpse into the state of the art in research associated with the emergence of new technologies. This article seeks also to identify gaps in our present

knowledge and to offer recommendations for future research and invite academics to contribute to this debate. These are the foci of the current section.

Five key findings can be identified, each with a complementary direction for future research. Firstly, it is notable that qualitative studies dominate the existing literature. This finding is not surprising because, for industrial relations researchers, especially those in the labour process tradition, "detailed case studies and ethnographies have been, and should be, the preferred approach" (Edwards, 2007: 19). This qualitative tendency might also be due to the fact that some digital technologies are almost exclusively used in a small handful of tech companies whose policies render quantitative approaches to understanding their functioning nearly impossible. This methodological limitation creates difficulties for scholars who wish to address, for example, the relationships between salary and skill-set in clearly defined work environments. Also, gaps in publicly available quantitative databases make it difficult for researchers to compare their results. This helps to explain why comparative studies of the impact of new technology in different socio-political and/or organisational contexts are largely absent, but it does not minimize the need for future research in this direction. Particularly, there is an urgent need for more empirical study in the global south, where new technology is being introduced into the workplace at a spectacular rate, yet researchers know little about their impact on workers' well-being and their work experience.

Secondly, when discussing the regulatory aspects of new technology in the workplace, most of the current debates take place on conceptual or philosophical levels (e.g., Ipofen and Kritikos, 2019; Baracskay, 2022). IR studies could help contribute to the debates by shining a light on the worker's experience. Thirdly, current research is largely silent on the question of how new technology affects workers with different demographic profiles (e.g., age, gender). Gender, and especially gender equality, is a key topic in IR, and more research is needed to understand how the technological impact is received and interpreted by the full range of workers.

Fourthly, there is a paucity of empirical macro-industrial studies, especially from an institutionalist perspective. This includes looking at how new technologies affect institutional arrangements such as employers' associations, professional associations, and trade unions. Under a macro-framework, there is also a need to look at the role government administrations

and legislatures play in promoting policy regulations on the implementation of new technology in the workplaces, and how labour disputes associated with the implementation are settled.

Fifthly, at the micro-level, there is a knowledge gap in topics other than workers' agency and experience. Micro-industrial relations, sometimes termed "workplace industrial relations", has a heritage of studying a variety of topics, including work design, skills and training, human resources policies (see Davies, 1986, chapter 1), but few of these scholars have directed their formidable theoretical and methodological efforts toward questions related to the introduction of 4IR technologies. Kaine and Josserand (2019) have argued that IR scholars know quite little about the impact of data-enabled technologies on traditional HR practice. How, for example, do workers manage their profile, reputation and credentials? How do these technologies affect the recruitment process? Future research should attend to these questions in order to provide a more in-depth understanding of not only the labour process, but also the wider impacts of digital technologies on labour markets.

5. Conclusion

The popularity of 4IR in policy discourse continues to be a driving force for transforming labour markets and the workplace. Twenty-three articles that offer insight into the empirical impact of new technology on work in conventional employment settings were subjected to intensive review. Although not exhaustive, this review synthesises what is known from the existing academic literature, identifies four ways in which scholars of industrial relations conceptualise new technology (automation, disruption, connectivity and interactivity, and control and monitoring), and outlines four key research objectives (implementation study, perception study, union study, and others).

The article began with a primary research question: What is known from the existing academic literature about the empirical impacts of new technology on work and employment? The findings of this scoping review suggest that while some studies have been conducted to investigate its impacts, scholarly attention is distributed unevenly. Therefore, five directions have been recommended for future research and debate. The greatest shortcoming is on the empirical side of the scholarly enterprise. Journals are replete with

articles that theorize, predict and prescribe, but are they relevant to the real world? We cannot know until more scholars get their hands dirty in efforts to uncover what is actually happening on the shop floor.

Lastly, the author acknowledges the article's limitations, particularly related to two of the methods employed. First, non-English publications were not reviewed, which can lead to a sampling bias against non-English speaking countries, and especially those in the global south. Second, in an ideal world, university libraries would provide access to all scholarly publications. This is not the case, however. As a result, some promising articles were not reviewed. For example, The University of Cambridge does not subscribe to the academic journal *Employee Relations.* Therefore, only the open access articles published in this journal were reviewed in this study.

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Appendix II Semi-structured interview questions

Introduction

1. Could you please introduce yourself? (e.g., your position, education background, work experience)

2. How did you enter this company? What attracts you into this field?

3. What is your perception of working in the internet industry in China?

4. How would you describe your work on a daily basis? What do you feel about it?

5. What kinds of technologies are involved in your daily work? (e.g., management software, machine-learning, big data analysis, robotics or others)

Work experience

6. Do you think your work will be replaced by AI technology in the coming decade?

7. What do you like and dislike the most about your job?

8. Do you think you have a say in how you do your work?

9. Do you think your voice will be listened by your colleagues / managers?

10. What is your usual office hour and working hours?

11. Do you think it is easy for you to take a day off to handle your personal matters?

12. Did your education prepare you for your job here? Why/why not?

13. Did your previous and/or on-the-job training equip the necessary skillsets for you to fulfil your job duties? Why/why not?

14. Do you consider yourself is a professional? Why/why not?

15. How would you describe your work relationship with your colleagues? Please give some examples.

16. To what extent you think [surveillance technology, machine-learning, big data analysis, robotics or others] technology is good for your work? To what extent it is not? What are the limitations? Please give some examples.

17. To what extent you think technology contributes to your long working hours?

18. Do you think [management software, machine-learning, big data analysis, robotics or others] technology makes you more productive? Please give some examples.

19. Do you have any privacy concerns when using these technology?

20. If you stay in this job, how do you see yourself in the coming future? Will you stay in this industry for long?

Internet industry in China

21. Is the work environment the same as you have expected before joining the industry or your current job? How does the environment change?

22. Currently, do you think China is a favourable place to develop a career in internet industry? Why or why not?

23. How do you see the future of internet industry in China? Why?

24. What can the Chinese governments do to facilitate the development of internet industry?

25. What can the Chinese governments do to improve your work conditions?

26. What do you think workers can do to improve your work conditions? Do you think you need a labour union to represent your interests? Do you think it is possible to unionise technology workers in China?

Concluding question

27. Are there any other issues related to our research that you would like to share?

Appendix III Informants' details

Informant number	Category	Position	Seniority	Age range	Gender
1	Tech worker	User analyst	Junior	25–30	M
2	Tech worker	Programmer	Junior	25–30	F
3	Tech worker	Media communication officer	Mid-level	30–35	F
4	Tech worker	User analyst	Junior	25–30	M
5	Tech worker	Marketing assistant	Junior	20–25	F
6	Tech worker	Technical support specialist	Junior	25–30	M
7	Tech worker	Marketing officer	Mid-level	30–35	F
8	Tech worker	Property manager	Mid-level	30–35	F
9	Tech worker	Senior programmer	Mid-level	30–35	M
10	Tech worker	Senior programmer	Mid-level	30–35	M
11	Tech worker	Programmer	Junior	25–30	M
12	Tech worker	Project manager	Mid-level	30–35	F
13	Tech worker	Marketing and Communication officer	Mid-level	30–35	F
14	Tech worker	Human resources manager	Mid-level	30–35	F
15	Tech worker	Marketing assistant	Junior	20–25	F
16	Tech worker	Marketing assistant	Junior	20–25	M
17	Tech worker	Graphic illustrator	Junior	25–30	F
18	Tech worker	Programmer	Junior	25–30	M
19	Tech worker	Product developer	Junior	30–35	M
20	Tech worker	Human resources executive	Junior	30–35	F
21	Tech worker	Programmer	Junior	30–35	M
22	Tech worker	Programmer	Mid-level	30–35	M
23	Tech worker	Product developer	Junior	30–35	M
24	Tech worker	Marketing assistant	Junior	25–30	M
25	Tech worker	Product developer	Junior	25–30	M
26	Tech worker	Programmer	Junior	25–30	M
27	Tech worker	Administrative assistant	Junior	30–35	F
28	Tech worker	Human resources manager	Mid-level	30–35	F
29	Tech worker	Senior programmer	Mid-level	30–35	M
30	Tech worker	Senior programmer	Mid-level	30–35	M
31	Tech worker	Product developer	Junior	30–35	M
32	Tech worker	Business manager	Mid-level	35–40	M
33	Tech worker	User analyst	Junior	25–30	M
34	Tech worker	Programmer	Junior	25–30	M
35	Tech worker	Content producer	Junior	25–30	F
36	Tech worker	Consumer analyst	Junior	25–30	F
37	Tech worker	Technician	Junior	30–35	M

38	Tech worker	Technician	Junior	30–35	M
39	Tech worker	Technician	Junior	30–35	M
40	Tech worker	Programmer	Junior	25–30	M
41	Tech worker	Programmer	Junior	25–30	M
42	Tech worker	Administrator	Junior	25–30	F
43	Tech worker	Marketing executive	Junior	25–30	F
44	Tech worker	Business Manager	Mid-level	30–35	F
45	Tech worker	Operations Manager	Mid-level	30–35	M
46	Tech worker	Project Manager	Mid-level	30–35	F
47	Tech worker	Marketing assistant	Junior	25–30	F
48	Tech worker	Senior Programmer	Mid-level	30–35	M
49	Tech worker	Administrator	Junior	30–35	F
50	Tech veteran	Programmer	Unknown	30–35	M
51	Tech veteran	Programmer	Mid-level	35–40	M
52	Tech veteran	Programmer	Mid-level	35–40	M
53	Tech veteran	Product developer	Unknown	30–35	M
54	Tech investor	Analyst	Senior	35–40	M
55	Tech investor	Investor	Senior	35–40	M
56	Tech journalist	Freelance reporter	Not applicable	30–35	F
57	Tech journalist	Reporter	Junior	25–30	F
58	Tech journalist	Reporter & editor	Junior	30–35	F
59	Tech journalist	Reporter	Junior	25–30	F
60	Tech journalist	Reporter	Junior	25–30	F
61	Tech journalist	Freelance writer	Not applicable	25–30	M