

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

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### 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 tech 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 tech 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.

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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'.<sup>1</sup> 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 tech 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 software, 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 discusses 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 internet 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 tech 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, Bingqing Xia (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 tech 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, tech 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 tech 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 work stations. 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. 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.

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 tech 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 tech workers who are relatively well-educated, highly-paid, and serve in 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 tech 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.

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 tech 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 tech 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 tech 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 discussing 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 tech 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 interpersonal 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 tech 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 tech 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.

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## 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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