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RESEARCH ARTICLE

REVERSED SOLUTIONISM

The Two-Sided Control of Crowdwork

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ABSTRACT: Platform labour is a new phenomenon that brings new forms of labour control with it. The article looks at crowdwork and analyses the various types of control inherent in this phenomenon. It is argued that crowdwork is not controlled by technological instruments alone, such as algorithms. Indeed, the method of organising labour is a complementary control element. Analytically, a technological and an organisational fix can be distinguished. Their specific characteristics are empirically investigated on the basis of crowdwork platforms covering the entire spectrum of qualifications. The result is that already existing asymmetries between capital and labour are intensified by the interaction between the technological and the organisational fix.

KEYWORDS: Crowdwork, Organisation, Platform Labour, Technology, Workplace Control

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1. Introduction

Algorithms have become omnipresent in the recent past. Even though they have taken on all kinds of different management duties, the focus on and the critique of them in labour-related contexts is necessary yet remains insufficient. The article argues that in addition to the technological fix focused on algorithms, an organisational fix

represents the complementary flipside of the coin. Both sides and their interaction can be analysed, using crowdwork as an example.

The tendency to narrow down the argument to technology criticism is not new. The zenith of Taylorism criticism, for example, went hand in hand with Taylorism's heyday. However, this was accompanied by a double deficiency. First, even though Braverman writes that "Taylorism dominates the world of production" (1974, 87) and Sohn-Rethel designates it as "the dominant form of the capitalist labour process" (1970, 155), Taylorism was by no means the predominant principle of labour organisation in the Western world. It was rarely realised in its pure form, such that its discursive impact was bigger than its practical influence (Drury 1915). Second, research also overestimates the capability of the phenomenon (Edwards 1979), and with the establishment of criticism, the belief in the potential of technology was adopted at the same time. Yet, this technological determinism was a central element of the criticised subject. With the algorithmically organised and controlled platform labour, the story seems to repeat itself. This new form of digitally mediated linking of labour and capital is spreading globally at a high rate of growth. However, this comes with the danger of adopting the technological determinism of start-ups, platforms and internet companies.

Evgeny Morozov aptly describes Silicon Valley's philosophy by lending it the term 'solutionism'. This is an "intellectual pathology that recognises problems as problems based on just one criterion: whether they are 'solvable' with a nice and clean technological solution at our disposal" (Morozov, 2013). Following this, the current critical discourse on platform labour in particular and technological control of labour in general can be identified as a reversed solutionism. According to Morozov and with a slight and decisive change, one could say, that "what's contentious, then, is not their proposed solution [critique] but their very definition of the problem itself" (Morozov 2014, 6). If technology only is identified as the central controlling and therefore dubious element, significant other aspects are possibly being neglected. By following the technological determinism of the apologists for the digitalisation of labour, one runs the risk of becoming mechanistic and focusing only on one side of the phenomenon.

Therefore, the general research question of the article asks how the labour process of crowdwork is controlled by the mediating platforms. In particular, the questions of the importance of organisational instruments and how they relate to technological forms of control are investigated.

2. Crowdwork – The liquefaction of labour

The term crowdsourcing as coined by Jeff Howe (2006) refers to a process by which an organisation or individuals receive a service or good from a potentially broad group of providers. The mediation does not necessarily require the use of the internet, so that the term also applies to earlier processes.¹ More recently, however, the concept has experienced rapid development and steady growth due to the proliferation of computers and the internet. Its variety is huge and there is an equally wide spectrum of terms to describe the phenomena. Focusing on labour, this article uses the concept of crowdwork. This is “defined broadly as paid work managed via online platforms” (Huws et al. 2016, 1). Specifically, this refers to goods and services that companies use via platforms and integrate into their value creation process. Thus, the focus is first and foremost on the mediation, coordination, management and control of practices, which are mostly sought by companies via online platforms and usually offered by self-employed workers.

Even with such a limitation, the observed phenomenon is extremely heterogeneous and in constant evolution (Howcroft and Bergvall-Kåreborn 2018; Huws et al. 2016). A helpful further differentiation is the subdivision according to the either local or remote nature of labour. The form of labour and the way in which it is controlled differs depending on whether its execution is bound to a specific location or whether it can be provided via internet from any place on earth. In addition, different forms of crowdwork can be differentiated depending on the qualification level of the labour. The spectrum ranges from simple local services or small online tasks to locally unbound, creative and knowledge labour. This article focuses on remote crowdwork across the entire spectrum of qualifications. This type of labour, its platforms and its tasks are steadily increasing and spreading globally (Lehdonvirta 2017).

Crowdwork started in the field of microtasks, for which it does not require any special qualifications (Bergvall-Kåreborn and Howcroft 2014; Lehdonvirta and Ernkvist 2011). In order to accomplish these numerous and low-paid tasks reliably, it is necessary to break down complex activities and larger projects into individual subtasks (Malone et al. 2011): „[B]reaking labour into little units, or modules, is one of the hallmarks of crowdsourcing” (Howe 2008, 49). This standardisation, modularisation and codification has always been a key requirement for outsourcing in general (Huws and Dahlmann 2009). However, in addition to this large field of microtasks, crowdwork is now increasingly used for complex jobs that require high qualifications, often team-

¹ For example, the first Oxford English Dictionary was created in 1884 using the "crowd".

work and usually creative and innovative solutions, such as in software development, design or marketing.

For companies, the benefits of this loose and liquid coupling of labour are obvious. With the help of crowdwork they can become flexible in terms of function and numbers by spontaneously claiming many different workforces (Felstiner 2011). Thus, they "transform fixed costs into variable ones" (Muehlberger 2005, 3) and exploit geographical differences in qualifications and wages (Graham et al. 2017; Lehdonvirta 2016). For the workers, this is associated with the promise of new income opportunities, the ability to determine working hours flexibly and independently, and in general to be one's own boss. There are, however, questions over the extent to which the flexibility and self-determination gained can be used by workers in the face of low pay and the continuing need to maintain one's individual status on these platforms (Schörpf et al. 2017). In many cases, similar to general outsourcing practices, crowdwork is more a form of 'insecurity-and-risk transfer chains' (Frade and Darmon 2005). Since the workers are no longer part of the companies, but independent contractors, numerous labour protection laws no longer apply to them as a result of the "independent contractor loophole" (Hill 2015, 3). Thus, crowdwork is also referred to as an escape from labour law by means of which also regularly employed workers are displaced (Erickson and Sørensen 2016). The beneficiaries of these arrangements state that there is no need for further regulation of crowdwork, with warnings that: "Crowd-working and crowd-sourcing are new forms of freely organised activity and free cooperation in the internet which cannot be captured in law. Neither are these forms of employment that can be regulated in any way" (BDA 2015, 5).

Data on the prevalence of platform labour are rare and diverse. In Germany, for example, 12% of the population perform paid labour organised via platforms (Huws et al. 2016, 23). However, another survey found that only 0.9% of the population do such work (Bonin and Rinne 2017). The difference may be explained by the fact that the latter survey was carried out by telephone and not via Internet and that follow-up questions were used to check whether the work was actually platform labour. Regardless of this, crowdwork is not so much relevant because of its size, but primarily because of its new form of organisation. Crowdwork platforms are an organisational avant-garde that face specific questions of coordination and control of labour that may in the future also concern other organizations.

For instance, the delegation of business activities to external self-employed workers brings the risk of a loss of intra-organisational information (Trompette et al. 2008) whilst, at the same time the use of external labour markets highlights the risk of planning insecurity (Lasecki et al. 2014). Especially relevant is the challenge to control

crowdwork because it is linked to the companies only via intermediary platforms (Leimeister et al. 2009; Zhao and Zhu 2014). As a result, this gives rise to classical questions of controlling the labour process and its results, both for higher skilled labour and microtasks. The classic answers are limited. Digitalisation is a central enabling condition of crowdwork and its dissemination. However, this effectively means that workers do not operate on the company premises like temporary workers, but are distributed globally, such that the labour process is not directly observable. At the same time, the temporary commitment to the company does not allow the creation of traditional forms of employee loyalty.

3. Controlling Platform Labour via Technological and Organisational Fixes

Coordination and control of labour is not a new challenge for organisations. However, the new technologies that enable crowdwork in the first place and allow labour to be divided into microtasks, distributed across the globe, are also a central tool for controlling these forms of labour. Technological control is, therefore, a genuine feature of platform labour. However, these technologies are not the sole central control element - even though this is often advocated. This technological control is complemented by the organisational element as the flipside of the same coin. In order to frame this thesis theoretically, David Harvey's concept of the (spatial) fix is set forth below - his "probably most successful as well as most misunderstood term" (Belina 2011, 242). For the analysis, the extension of this approach by Beverly Silver is considered, allowing a differentiation between technological and organisational fixes.

David Harvey follows Marx on the assumption that in capitalism overaccumulation occurs regularly. Markets are flooded with goods and capital without finding buyers. The result is a massive devaluation of capital and economic crises that can affect other social fields. However, overaccumulation is in many cases a phenomenon that is located regionally or in individual subfields. According to Harvey, these crises can be delayed by shifting capital into other economic cycles, such as real estate (Harvey 2001, 59; 1982, 235). Economic crises are thus prevented by geographical relocation, expansion and restructuring. However, such a reversal of a crisis is only a delay and, therefore, never permanent. It reproduces the capitalist contradictions elsewhere in greater intensity: "There is, in short, no spatial fix that can contain the contradictions of capitalism in the long run" (Harvey 1982, 442).

Thus, the emergence of platform economies as a result of the global financial crisis is no coincidence - Uber as the archetype of platform labour was established in 2009 and

also many of the crowdwork platforms were established in the aftermath of the financial crisis. The technological innovations that enable the standardisation, modularisation and codification of labour are not the necessary conditions of development. Of equal importance are large amounts of capital, which went in search of investment opportunities as a result of the financial crisis and thus form the financial basis of these platforms. Thus, they correspond to Harvey's fix as a "crisis-induced creation of new spatial configurations through the spatial redistribution of capital and jobs" (Wissen and Naumann 2008, 395). Even today, many of the platforms are not profitable and continue to rely on continued capital inflows. Hence, venture capital continues to be the financial basis of their day-to-day business and their intense expansionary aspirations.

The "creative destruction" in the form of an outstanding product innovation is thus far less the core of the phenomenon, which leads to possible "[s]pectacular prizes" (Schumpeter 1942, 73) for the platforms. Instead, the hoped-for profits are based on the loss-making, stamina and "turning off" of competition with the proclaimed goal of monopolising, because "competition is for losers" (Thiel 2014). In doing so, this venture capitalists' bet on high future profits generated by the platform companies extends the payback period. Following Harvey, it can be assumed that this prolonged commitment of capital will only delay the next crisis. The result of investment is increasing productivity of labour, which in turn leads to a new overaccumulation and extensive capital devaluation (Harvey 1982, 219).

In her analysis of the development of globally distributed labour disputes, Beverly Silver (2003) expands and specifies the concept of the fix in order to highlight the question of control of labour and its change. She shines a light on the question of how companies are trying to solve not only profitability crises but also to gain control of labour via capital transfers. Capital is therefore not only moved in situations of overaccumulation, but also if its profitability resulting from increasing resistance brings with it either stronger control efforts or concessions to the workers. On the capital side, there are many more options for action than relocation alone. Based on Harvey's spatial fix, she differentiates between "product", "financial" and "technological" fix (2003, 39). As a result of profitability and control crises, companies not only relocate their production sites to other locations. Indeed, the evasive movement may lead to new product lines or even industries, or a widespread withdrawal from production and an investment in the international financial markets instead. Moreover, according to Silver (2003, 39), adversities in the production process may also be encountered by means of new technological and organisational instruments.

Crowdwork comprises all fixes addressed by Silver - but as an interaction of several stakeholders. Capital owners are looking for investment opportunities on the international market, which they usually channel into venture capital funds to invest in platform companies (financial fix). Their central selling point is the new product of fragmenting, distributing and merging labour, which also creates new spatial configurations (product fix). In turn, the platforms themselves make intensive reference to process innovations in order to coordinate the various stakeholders and, in particular, to coordinate and control labour (technological fix). Only the interplay of the various aspects makes up the production model of the platform economies and their specific dynamics. In the following, the focus is on the technological fix.

The ambiguity of the English term leaves room for confusion. On the one hand, "technological fix" signifies an established term, which refers to the practice of solving (social) problems by technological means. At the same time, "technology" stands for a technique or a method. Silver uses the term in a double sense. For example, the term refers to technical innovations such as ring spinning machines, which replaced mule spinning machines in the late 19th century, resulting in rationalisation and at the same time the regaining of control over labour by companies (Silver 2003, 87). On the other hand, Silver describes "post-Fordist organisational transformations" (2003, 66) by Japanese automakers and the associated proliferation of new organisational methods such as lean management (Silver 2003, 66–69). Thus, two very different processes, the use of new technological innovations on the one hand and the application of specific organisational arrangements on the other, are conceived under the same concept. Accordingly, both technical and organisational components are inherent in the term "technological fix", which is why Silver refers to a "technological/organisational fix" several times (Silver 2003, 76, 81, 131, 134, 159, 163). In terms of control of labour, technology and organisation are two sides of the same coin. Both are complementary and interwoven in social practices, but can analytically be separated and characterised by different specifics and dynamics. This implicit but often unclear assumption of Silver's work is at the focus of the following analysis of crowdwork control. It distinguishes itself from previous analyses of platform economies, which usually focus on the technological components only and disregard organisational aspects.

4. Subject of investigation and methods

Subjects of the study were four different crowdwork platforms. They were selected based on theoretical sampling with the aim of developing object-related theoretical concepts (Glaser and Strauss 1967). For this purpose, crowdwork platforms covering the entire spectrum were included in the sample. The essential criterion for selecting the platforms was the workers' required qualification. Since lower skilled work involves other control mechanisms than higher qualified ones, different references to the technological and the organisational fix were expected. Accordingly, two of the platforms are in the field of microtasks and two are for higher qualified workers.

The first category includes Amazon's Mechanical Turk platform. It has existed since 2005, making it the oldest of its kind. Its origins lie in the challenge of identifying duplication in Amazon's product catalogue. This is a simple activity that cannot be solved by artificial intelligence. Therefore, Mechanical Turk called the service "artificial artificial intelligence" and Amazon's CEO described it as "humans-as-a-service". Customers are promised access to a "global, on-demand, 24x7 workforce". In terms of content, the human intelligence tasks offered on this platform are, for example, the marking of photos, transcriptions or participation in polls. As a rule, only the successfully completed task is rewarded. The height of pay for these subdivided tasks is usually in the cent range. The second platform Figure Eight (formerly CrowdFlower) is similar in terms of structure, content and target group and refers to their services as "human-in-the-loop" in which also the non-automatable aspects of artificial intelligence are taken over by humans. It is the largest English-language platform of its kind. Higher skilled workers are mediated by the other two platforms in the sample. With the slogan "hire freelancers, make things happen", Upwork targets larger projects for independent and mostly subject-specific experts. As the largest crowdwork platform for highly qualified workers, it reported 14 million users in 2017. In comparison, Jovoto, the fourth platform in the sample, is much smaller with just under 90,000 users. According to Jovoto, its focus is not on quantity but on quality of the workers in the field of "Design, Art and Marketing". Its "talent pool" can be entered only with a highly rated portfolio, showcasing the workers' skills and experience. With the help of its pools of "creative professionals", the platform promises to accelerate the innovation cycles of companies.

All platforms are the most relevant and largest in their field, with the exception of Jovoto, which exemplifies mostly smaller and highly skilled work-focused platforms. In all of these companies, the platforms through which requester and crowdworker interact are central. These interactions are exclusively mediated as a face-to-interface relationship. The platforms act as intermediaries that centrally shape the labour rela-

tions. Any company strategy is reflected in the way the platforms are programmed. It is, above all, necessary to research the design of these platforms, for which the immediate experience is particularly suitable. Interviews with platform workers are useful as a common research method for analysing their lives and subjective experiences. However, this approach to the phenomenon is insufficient for two reasons. First of all, interviews are not just a stimulus but also an intervention that detaches the interviewee from the very same practice that is the focus of the study (Burawoy 1998, S. 14). Thus, only retrospective abstract content, of which the interviewees are aware, can actually be queried. Second, digital artefacts enter the equation through the technological mediation and control of the labour relations. And these are not available for interviews. Because of this, the sample was examined ethnographically. An ethnographic approach is not uncommon in the sociology of labour, but it is applied here to the analysis of the mediating digital artefacts and ecosystems. Focus was not on participant observation but on observing participation (Parkin 2017; Wacquant 2006). Crowdwork was carried out in the form of virtual self-ethnography (Crang and Cook 2007; Hine 2000) with the medium itself and how it controls the labour process as the subject of investigation. In this way, the app and its coordination and control of labour were examined. Thus, a nuanced first-hand understanding of the labour process was acquired. At the same time, the functions of the app could be explored by means of targeted stimuli using “a sequence of experiments that continue until one's theory is in sync with the world one studies” (Burawoy 1998, 17–18). In dealing with the specific subject of research, such an approach allows specifically the platforms’ “infrastructures of participation” (Beer 2013) to be explored and tested by means of testing hypotheses via interventions.

The survey period was from August to October 2018. Accounts were created on all four platforms and various tasks were completed, during which the coordination and control of the labour process was explored and recorded. Following the criterion of theoretical saturation, the individual surveys were completed as soon as no new knowledge could be gained, so that a ‘conceptual representativeness’ was achieved (Saunders et al. 2018). The result was a comprehensive documentation of the labour processes in the form of field notes and screenshots. These were analysed according to the criteria of computer-aided qualitative content analysis (Kuckartz 2016).

5. Findings

As discussed above, the control of platform labour can be analytically differentiated into two aspects, technology and organisation. The following examines the investigated platforms with regard to the technological and the organisational fix.

The Technological Fix

Technology is at the same time a central enabling condition of crowdwork and an instrument for "the watchfulness of management" (Taylor 1911, 85). Technologies are primarily used in administrative areas and in the monitoring of the labour process. Classically, these tasks would otherwise be consigned to middle and lower management. Computational and algorithmic systems are well placed to map this kind of routine order-allocation, labour-process-monitoring and outcome-control decisions. In addition, this approach allows many more variables to be taken into account in decision-making as well as governance and, according to companies' hopes, make labour processes more effective and efficient. Any fundamental changes made by the higher levels of management need not be communicated as per the usual channels, but are simply programmed into the software.

Such algorithmic management refers to the pursuit of entrepreneurial activities – in this case especially the organisation and control of labour processes – through the application of technological innovations based on automated algorithmic decision-making. In this way, it is possible for companies to organise a large number of diverse workers and to make numerous different decisions directly and automatically (Heiland 2018; Lee et al. 2015). In the case of crowdwork, this relatively new practice allows direct control over self-employed and globally dispersed workers. Thus, a platform can continue to exercise control over workers who are only loosely linked and market-bound to the companies. The platform workers, on the other hand, are free to offer their labour on a case by case basis and yet are closely bound to the way they perform their labour.

Direct technological control instruments are keyloggers that record the workers' keystrokes. Upwork uses time sheet applications that are used to record the working time and take screenshots of the crowdworker's desktop randomly within ten minute segments.² The requester can see the workers' "activity meter" that shows the num-

² Only those workers who use this feature can use *Upworks'* payment guarantee. Otherwise they are dependent on the probity of the requester in paying the promised amount on completion of the work.

ber of mouse clicks, scroll actions and keystrokes per time segment. With these monitoring tools, platforms and contractors can ensure that workers, if they are paid hourly, actually spend that time on the assigned task, transforming their labour capacity into concrete labour. This is analogous to direct control in classic workplaces and gives the workers an "invisible supervisor" (Elliott and Long 2016, 138) or as one worker writes: "It feels as if the client is over my shoulder, it's like micromanaging".³ And as a consequence of such a digital panopticon, it can be assumed that the workers develop a highly individualised sense of the responsibility of their own employment and its continuation (Neff 2012, 28). However, in some countries this form of surveillance is prohibited by law. The effectiveness of such regulations is limited in the light of the global nature of the labour relations. When used, this form of control is merely quantitative. Although Upwork explicitly states that the meaningfulness of the activity meter depends on the type of labour⁴, it has a powerful impact as an apparent visualisation of labour efficiency. For example, during the survey, one company gave a poor rating on the grounds that the data of the time tracker app were not good, even though the task required only sporadic computer activity. In general, this form of technological control is only partially relevant in the case of Upwork, since many jobs are paid as a piece-rate wage. Thus, either small amounts for separate tasks or larger sums for the completion of entire projects are paid, such that the efficiency of the labour process does not concern the platforms but the crowdworkers.

Both Figure Eight and Mechanical Turk, on the other hand, use automatic evaluations of the completed tasks to determine the validity of the results. Tasks can be distributed to three workers. If one of the contractors deviates from the results (for example, tagging a picture) of two other workers, her result is automatically classified as incorrect and the reward can be denied. At the same time, this review policy called "plurality" is used at Upwork to calculate a "confidence score" for the results.

Generally, however, the technological fix is less expressed in such direct control practices (Friedman 1977). Instead, in most cases it is an algocratic control of the labour process, that is, the "rule of the algorithm" or "rule of the code" (Aneesh 2009, 350). This algocratic system "consists of programming embedded in global software platforms that structure possible forms of labour performance. This system enables the monitoring of labour through the design of the labour process itself" (Aneesh 2009, 349). Such an algocratic technological fix thus defines "grammars of action" (Agre 1994). It is therefore less necessary to control the labour process, since a deviation

³ <https://community.upwork.com/t5/Freelancers/Disabling-screenshots/m-p/119646/highlight/true#M61861>

⁴ <https://support.upwork.com/hc/en-us/articles/211062278-Review-Your-Freelancer-s-Work-Diary>

from the given framework is quasi impossible. What used to be the formal rules of the organisation becomes inevitable law by programming the software. And such a form of corporate governance is especially effective in crowdwork, where all communication takes place online and the channels used are based on the platform's software code. For example, if a worker at Mechanical Turk has selected a task, it must be done immediately within the time limit set by the client, as the field notes show: „30 minutes are available to complete the task. Sufficient time if you do it immediately. I mark half of the pictures and let the time run out. I am automatically removed from the task, the labour carried out thus far is not saved and no compensation is paid" (P1: 163).

The platforms help their clients to put their orders online in the appropriate form. For example, Figure Eight customers can upload jobs in the form of a "custom markup language" (similar to HTML). The platform then automatically takes over the distribution of these data rows to individual workers who are assigned a specific task at the same time, which they usually only have to do in an unmistakable form. The results are thus automatically presented in the necessary form, so that it is difficult to deviate during the labour process itself. The results are compared with the replies of other workers using the automatic comparison described above.

Figure Eight also features an automatic pre-selection of workers. Each job is preceded by a "Quiz Mode" in which interested workers have to answer test questions. From the resulting score, the individual's accuracy is calculated: "If a contributor's accuracy falls below a preset threshold, they become 'untrusted', their judgment is tainted, and they are no longer allowed to participate in that job", as stated in the glossary of the platform.⁵ This was also reflected in the study in which poorly executed "quizzes" even with only minor mistakes led to exclusion from the corresponding jobs.

Central to this algorithmic control is that the algorithms are black boxes. There is no transparency on the criteria used to make decisions, assign orders or impose sanctions. "[C]ompanies are rarely motivated to disclose the underpinning criteria of their algorithms and are sometimes unable to fully explain the results themselves, creating very low transparency for those managed by the algorithms" (Möhlmann and Zalmanson 2017, 5). Demands on the platforms are only successful in exceptional cases, as a requester of Mechanical Turk confirmed: "You can not spend time exchanging e-mail. The time you spent looking at the e-mail costs more than what you paid them. This has to be on autopilot as an algorithmic system...and integrated with your business processes" (Irani 2015, 229–230).

⁵ <https://success.figure-eight.com/hc/en-us/articles/202703305-Getting-Started-Glossary-of-Terms#unit>

Jovoto exemplifies the limits of technological control. Due to the specificity of creative work as well as its own logic and time, the labour process is free of direct control by the platform. The technological fix is used solely as part of the automated recording of the individual users' performance, which is listed on their profile pages in the form of achievements and karma points (consisting of posted comments and ratings for other projects, uploaded and winning ideas and joint projects). Algoratic design comes into play with regard to the assignment of the projects, for example, when workers can only apply for projects according to their previously verified skillset as any others will not be displayed.

In summary, it can be said that the different forms of crowdwork generally have three aspects of varying degrees in common: algoratic communication and coordination mediated solely by the software, the recording of individual performances and information asymmetries.

1. Communication between platform and workers is unilateral and top-down thanks to the specifications of digital algoratic coding outlined above. The respective platform is the central mediator between the requester and the workers. Usually, there is no personal contact between workers and platforms.
2. The individual performance of the platform workers becomes relevant when, for instance, further job offers are made algorithmically and are based on the number of jobs completed and the evaluations assigned to the workers. In addition to the method of recording, the execution of the labour is sometimes monitored in detail via surveillance instruments.
3. The platforms deliberately produce information asymmetries that allow them to control the labour process. Usually the workers do not know why they are given a job opportunity or not. The workers are therefore unaware of the requirements on which the decisions are based.

However, even the algorithmic and algoratic control of crowdwork does not mean that the workers are devoid of agency. Experienced workers are capable of seeing through some aspects of the technological system and influencing them in their favour. For example, as a crowdworker on Upwork one can use the fact that one of the algorithms displays automatic job offers and recommendations based on previous inputs in the corresponding search mask of the platform. In this way, workers can influence and optimise the type of jobs they see (Jarrah and Sutherland 2018, 7). In the survey, it was found that it was possible to contact requesters and manipulate the hourly wage with their help, as an extract from the field notes shows: "The third requester contacted responds. He says, he is happy to be of assistance and offers to register only one

hour than the actual two the task required, without reducing the pay. As a result, my hourly rate rises and so does my bargaining position for future assignments" (P3: 65).

As stated, the technological fix is a central element to controlling the crowdworkers and their labour processes which are dispersed in a global space and are only loosely linked to the companies and platforms. Algorithmic and algocratic control techniques severely restrict the workers' freedom, but they are not all-encompassing. However, deviating from or influencing the technological fix requires experience with the respective platforms and pronounced digital literacy. At the same time, this highlights that sole technological control is not enough. Up to this point, it remains unclear why the workers submit to technological control. In addition, the effectiveness of technological control decreases with increasing complexity and individuality of labour, such that, for example, Jovoto exercises very little control of this kind. Therefore, one needs to look at the complementary element of the organisational fix.

The Organisational Fix

The central organisational control tool in crowdwork as well as in many platform economies in general are internal markets. In addition to the usual inter-platform competition in which different platforms compete for market share, capital and labour, crowdwork platforms create a closed intra-platform competition in which the workers compete with each other. The platforms themselves act as gatekeepers, which can regulate the number of market participants by granting access rights. In addition, and with the help of the technological fix, the platforms regulate almost all parameters of the internal market. However, this internal market does not serve to negotiate prices, as is the case with other platforms (e.g. AirBnB or eBay). Instead, based on the individual performances that represent the currency in these internal markets, a status is generated that opens access to more profitable tasks and projects. Thus, the workers in these markets are in competition for the possibility of (good and profitable) labour.

This type of intra-platform markets acts as an efficient coordination tool since it creates a marker for the platforms and the requesters, which allows the workforce to be differentiated. Thus, markets serve as a complexity reducer in the form of "information gathering and shortening" (Luhmann 1988, 233), which cuts transaction costs incurred in initiating interactions. These markets act as an organisational fix which is marked by an asymmetry that contradicts idealistic assumptions about the constitution of markets in neoclassical economic theory. There is no perfect competition. And the purpose of these markets is not only the efficient coordination of different stakeholders, but primarily their effective control. By emphasising the performance of crowdworkers, the

comparatively free and flexible workers are required to adhere to the criteria defined by the platforms and to work efficiently. This organisational fix reduces complexity for platforms and companies alone. The workers are faced with being reduced to individual key figures, which often does justice neither to their individual competences nor their needs.

Such a form of control via internal markets is similar in its intention to the "responsible autonomy" identified by Friedman (1977). It occurs in places where direct control is not possible or too expensive. Even though the workers have some freedom to move despite the algorithmic and algocratic arrangements, they seldom use it for autonomous or even resisting action. However, as with Friedman, the reason for this is not that workers are given autonomous opportunities for self-realisation and identification with the companies or platforms. Instead, competition with other crowdworkers and the concomitant concern over the platform's internal status ensure the individual's need to work.

At Mechanical Turk, the individual status of the workers does not derive from direct assessments by the requester: "Mechanical Turk provides system qualification types that keep track of a worker's statistics and attributes" the platform writes in their FAQs for requester.⁶ The acceptance or rejection of the labour carried out is particularly decisive as a parameter for measuring the workers' performance. Requesters can reject finished labour without justification and even block individual workers. Only upon acceptance of the completed tasks do the workers receive the agreed payment. In the process, completed but rejected labour becomes the property of the requester. At the same time, rejected tasks degrade the individual approval rating of the workers. This is relevant because requesters at Mechanical Turk can define the criteria that determine which workers will see the task. Central to this is the approval rating and the number of completed tasks - the standard requirement is that workers have a 95% approval rating. More profitable tasks are therefore usually only displayed to workers with a good status. The result of rejected tasks is thus not only unpaid labour, but also a long-term worsening of income opportunities, especially with a low total number of completed jobs. With persistent rejections of the completed labour the workers' accounts can be deactivated automatically. Two tasks were rejected during the survey at Mechanical Turk. One automatically because it deviated from the results of two other workers and one directly from the requester. "The third task is rejected by the requester. Even after several attempts to contact the requester, no reasons are given for the rejection. But

⁶ <https://docs.aws.amazon.com/AWSMechTurk/latest/RequesterUI/ManagingQualificationTypes.html>

the result is that my approval rating decreases and I can choose between less and less profitable ones" (P1: 71).

At Figure Eight, users can be evaluated by requesters as well as other workers and the platform. Especially important are the values automatically generated based on individual performance. These are: completed tasks, correct or incorrectly answered test questions and the "agreement" resulting from the congruence of the workers' answers with other contributors. If workers have a low error rate and good ratings, they can earn badges that allow access to other tasks. All of these evaluation mechanisms are one-sided. Only the requester can rate the contributor, not the other way around. In a quantitative survey, only 62% of respondents said these ratings were fair more than half the time.⁷ In comparison to false or unfair ratings by requesters, the workers have few options for action although the effects can be far-reaching. Requesters on Figure Eight are even authorised to label bad workers negatively, what can have serious consequences, as the field notes show: "I take six jobs and finish them poorly or incompletely. This results in bad reviews. Also, I lose a few of the badges I previously acquired. Without these and with poor status due to the negative evaluations it is almost impossible to get acceptable work" (P3: 147).

For the higher-skilled platforms, Upwork and Jovoto, ratings are not carried out automatically and the workers' specific profiles are far more important. Accordingly, on both platforms, the workers' profiles are more detailed. For example, workers can present work samples, introduce themselves individually and complete a variety of tests to prove specific skills and take on specific jobs. The visibility of the results of these tests for potential employers is individually adjustable. While Upwork's tests are usually automated and include, for example, language tests, Jovoto requires work samples based on which workers' skills are being evaluated. "My submitted poster design is rejected as insufficient. A new one costs me several hours of work and activation for specific design tasks is delayed by three weeks" (P4: 28). As the field notes show, certification is more time-consuming and laborious, which is also due to the higher qualification requirements of the platform's target group.

At Upwork, the performance statistics recorded using the technological fix are far more sophisticated, allowing workers to "see where they are stacking up against the competition and what they need to work on".⁸ This includes the individual "invitation response time", how many people are visiting the profile, how often the workers get hired and overall reputation. Especially the latter is of relevance. It is from these values, according to a non-transparent formula, that the "job success score" is calculated,

⁷ <http://faircrowd.work/platform/crowdfLOWER/>

⁸ <https://support.upwork.com/hc/en-us/articles/211062968-My-Stats>

which, in turn, is displayed to the requesters and serves as a central criterion of distinction between the different, often identically qualified workers. Most jobs on Upwork require at least a 90% job success score. This is also due to the fact that this value is the default setting when creating a job as a requester. As a consequence, especially where not many orders have been completed, a few bad reviews automatically prevent further job opportunities. In such a case, workers are advised to "go on a job-hunting spree to 'drown out' bad contracts"⁹, as the field notes demonstrate too: "After several poorly completed assignments and the resulting decreasing reputation, it takes six other successfully finished jobs with substandard pay to return to an acceptable 'job success score'" (P3: 126). In addition to such visual assessments, clients at Upwork have the opportunity to give the workers "private feedback" that the latter cannot actually see. Of particular importance here is the question of how likely they would be to recommend the freelancers to a colleague on a scale of 0 to 10. The value of 9 may already have a negative impact on the job success score.

As a platform for creative labour, Jovoto constitutes quite a contrast. Here, internal markets are created less to reduce complexity or control the labour process. Instead, the allocation of tasks is organised solely by means of a market. Companies acquire the opportunity to post "brand challenges" on the platform that allow registered freelancers to submit ideas and designs. Nonetheless, workers' in-platform status plays a role as companies can post private competitions for higher fees, in which only the top ten percent of users can participate – with a percentage as a relational criterion, the workers have to engage in status work on a permanent basis. Alternatively, the companies can create flexible projects whose participation criteria can be determined individually.

As shown, intra-platform markets play a relevant role in the coordination and control of crowdwork. But despite these arrangements, crowdworkers strive to gain autonomous agency. Thus, they sometimes set up requester accounts on the platforms in order to get to know the other side and adapt their own strategy accordingly (Jarrahi and Sutherland 2018, 5–6). Or they try to break down larger jobs into smaller ones, and thus gain multiple ratings instead of just one (Jarrahi and Sutherland 2018, 8). In this way, the workers gain knowledge about the otherwise opaque algorithms and algocratic regulations. They use this digital literacy to act on the platforms autonomously and to gain a better position on these markets. Mechanical Turk offers workers no opportunity to discuss such practices and labour related information in general. Therefore, many of the crowdworkers find each other in external online communities, such as in Facebook groups, Slack or Reddit forums, as well as Skype and WhatsApp chats – which

⁹ <https://freelancetowin.com/job-success-score/#jobsuccess8>

are also available for Figure Eight and Upwork. These forums act as complementary parallel communication structures independent from the platforms.

In order to counterbalance the asymmetry of evaluations in the case of Mechanical Turk, scholars have programmed an add-on for internet browsers with the help of which requesters can be evaluated, such that difficult and payment averse customers can be identified and avoided by the crowdworkers. Such opportunities for communication, which counteract both the asymmetries and opacities inherent in the platforms, are valuable instruments for workers seeking to increase their autonomy. At the same time, such instruments are only used by a minority. In a survey, 58% of respondents said they were not aware of any such communication channels (Berg, Furrer, Harmon, Rani & Silberman 2018, S. 80).

6. Discussion

As the findings show, both the technological and the organisational components are important for the control of crowdwork. The relevance of the fixes and how they interact with each other depends on the qualification level of the targeted labour. There is a continuum in which, on the one hand there are simple microtasks that are subject to technological control (Mechanical Turk and Figure Eight). This is expressed by direct automated and algorithmic management practices as well as indirect algocratic control. However, even in these low-skilled forms of labour, the workers are forced into competition with each other and, by means of the organisational fix, they have to carry out their work efficiently in order to acquire a good status. Only by doing so can workers gain access to (profitable) job opportunities on the intra-platform markets.

As a platform for higher-skilled labour, Upwork uses time sheet applications, a direct technological control form, which is, however, only applied to tasks that are paid per hour – and which do not constitute the majority of jobs on the platform. As the tasks are both more demanding and more sophisticated, the individual profile of the workers is more important. However, the organisational fix in the form of the workers' individual status is very relevant. This is because there is usually fierce competition for work assignments, such that the individual "job success score" as an intra-platform status is crucial for the distribution of jobs. With higher qualifications the technological control decreases whilst its complementary organisational form increases.

At the other end of the continuum, Jovoto operates as a platform for highly qualified labour. Control in the form of the technological fix is used here only to a limited extent. Creative work proves to be surveillance-resistant. In addition, the workers' skills and

achievements are particularly individual, such that they can be made to compete with each other only partially. Nevertheless, the workers also acquire an intra-platform status, which helps the requesters to differentiate between the workforce whilst serving as a criterion for workers to access specific profitable assignments.

In summary, it can be said that simple crowdwork is controlled not only technologically, but also organisationally. As the level of qualifications rises, the relevance of technological control decreases and the importance of organisational control increases. An exception is highly qualified and individualised creative work, which is resistant to rationalisation and is subject to limited control both technologically and organisationally.

Technology does not suffice as the only coordination and control instrument. All platforms use additional organisational control through internal markets to varying degrees. Following Beverly Silver, this organisational fix is closely linked to the platforms' technological infrastructure. The technology enables automated market formation. The intra-platform markets are not solely a social phenomenon, emerging from the actions of various individuals following their own interests. Instead, they are a coordination and control mechanism steered by the use of algorithms and algocratic structures. As Polanyi (1944), Fligstein (1996) and more recently Ahrne, Aspers and Brunsson (2015) show, markets are not a natural phenomenon but a social, organised and political process. In the cases considered here, the organisation of the markets lies solely with the platforms, which program each of the crucial parameters unilaterally and in this way specify the algocratic corridors of action. Therefore, the technological and organisational fix go hand in hand and only together do they enable an effective and efficient control of digital labour. Both are complementary and only effective together. Workers' labour performance is technologically recorded and translated into the market variables defined by the platforms, creating an individual status. Deviations are automatically made impossible by algocracy or sanctioned by the algorithms. The sanctioning power of this technological fix has an impact on individual status beyond the individual case. A sanction is thus not limited to a single job, but can also make the acquisition of further employment opportunities more difficult or even impossible due to the organisational fix. Crowdworkers not only have to use their labour within technological limits, but they are also obliged to carry out status work. In addition, the developed status binds the workers to the individual platforms. It creates a barrier to moving to other platforms such that multi-homing – that is working on different platforms - becomes a limited rational strategy.

Crowdwork refutes and confirms the findings of labour sociology so far: It turns out that even simple service labour has not yet reached the limits of its rationalisation and

that there is still scope for subsumption of labour under capital through technological and organisational innovations. In part, this applies to the field of creative knowledge labour in which crowdwork establishes new forms of control. At the same time, however, the limits of the rationalisation and controllability of labour are clearly shown here. However, this is not only due to the specifics of knowledge and creative labour. In general, the difference between the design and the interaction of the control mechanisms does not solely depend on the variables qualification and complexity of the labour, but also on the workers' market power (Silver 2003; Wright 2000). The platforms have an inherent and programmed asymmetry between requester and worker. However, this asymmetry in general and any rating system, and thus the establishment of internal markets where workers are put in competition with each other in particular, will only work if there is at least a minimum of workers competing for a limited number of job opportunities. When a crowdworker has a specific skill set and is the only provider in her field, both the technological as well as the organisational fix lose their effect.

7. Conclusion

Crowdwork brings new challenges in terms of coordination and control of work. As stated, the solutions offered by the platforms are not technology-based alone. The technological fix, which is supposed to counteract crises of profitability and control of capital, is supplemented by a complementary organisational fix. While technological control in crowdwork is exercised via algorithms and algocratic structures, organisational control is characterised by the construction of intra-platform markets, on which crowdworkers compete with each other. The technological fix is therefore by no means irrelevant. However, it only acquires its relevance in conjunction with a complementary organisational fix that represents the flipside of the coin. The mixing ratio of the two strongly depends on the qualification level the platforms expect from the workers. While simple labour shows high degrees of technological control, organisational control is a central element as well. As the level of qualification rises, the amount of technological control decreases and its organisational form increases, with creative labour emerging as a type of work which is largely immune to both types of control.

By means of the organisational fix, the requesters have a powerful position over the crowdworker beyond the current project. In some cases, they are not only able to withhold payment in spite of the service provided, but they can make it difficult or completely prevent future job opportunities for workers with poor ratings. The already

existing asymmetry of power between labour and capital is reinforced by the organisational fix. The consequence is conformity, anticipatory obedience and unpaid status labour by crowdworkers.

However, both the extensive disempowerment of workers and their control by means of performance-based status are dependent on a low market power of the workers. If the reserve army mechanism is not strong and platform workers are in short supply, the regulation and control efforts of the platforms have only limited effects. In particular, if the workers have low market power - either as a result of low qualifications or if no meaningful status has been acquired on the platform - the workers are forced to avoid misconduct and contradictions and are limited in the choice of jobs offered to them.

According to Polanyi, the specific form of control of the organisational fix set out here clearly falls within the scope of a "market society" where "instead of the economy being embedded in social relations, social relations are embedded in the economy" (Polanyi 1944, 57). Some describe this supposedly neutral, market-based organisation as a fair regulatory and redistributive instrument, as the individually influenceable benefit rather than the status determining the situation (Botsman 2015). However, as stated, the opposite is the case and evaluations function as an effective control tool that reinforces rather than reduces existing asymmetries between capital and labour.

Some concluding remarks have to be made concerning the limitations and the need for further research. The article investigates the control regime of crowdwork directly by observing participation. Thereby, the central mechanisms become visible. The subjective experiences of the crowdworker are disregarded, so that the actual effect of the different forms of control in the course of employment of the affected persons and their lives can deviate. This points to a limit of the findings as well as the need for further research. In addition, it would be promising to study other aspects of organisational arrangements and to explore the interdependencies of technology and organisation in the workplace control regime of digital work.

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