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Altenried, Moritz

Erstveröffentlichung / Primary Publication

Konferenzbeitrag / conference paper

### Empfohlene Zitierung / Suggested Citation:

Altenried, M. (2023). Standardization and Heterogenization: The Automation of Management and the Multiplication of Labour. In *Proceedings of the Weizenbaum Conference 2023: AI, Big Data, Social Media, and People on the Move* (pp. 1-9). Berlin: Weizenbaum Institute for the Networked Society - The German Internet Institute. <https://doi.org/10.34669/wi.cp/5.1>

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**Proceedings of the Weizenbaum Conference 2023:  
AI, Big Data, Social Media, and People on the Move**

# **STANDARDIZATION AND HETEROGENIZATION**

**THE AUTOMATION OF MANAGEMENT AND THE  
MULTIPLICATION OF LABOUR**

**Altenried, Moritz**

Berliner Institut für Empirische  
Integrations- und Migrationsforschung  
Humboldt-Universität zu Berlin  
Berlin, Germany  
[moritz.altenried@hu-berlin.de](mailto:moritz.altenried@hu-berlin.de)

## **KEYWORDS**

labour; algorithmic management; migration; platforms; gig economy

## **ABSTRACT**

Algorithmic management is increasingly used to (semi-)automatically organise, measure and control labour in many sectors and industries. Based on empirical research in the (online and location-bound) gig economy, the paper argues that this digital automation of management allows for the quick and flexible inclusion of a broad range of workers in very diverse situations into production. This is shown, firstly, by the example of crowdwork platforms and their ability to integrate diverse and spatially distributed workers into labour processes. Secondly, the paper analyses the role of migrant labour for the urban gig economy and argues, that here, too, digital technologies and algorithmic management are to be understood as being part and parcel of a multifaceted process of the heterogenization of workforces. This particular effect and quality of algorithmic management and digital standardization is conceptually analysed in the framework of a multiplication of labour.

# 1 INTRODUCTION

Across the world of work digital technologies are increasingly used to plan, organise, measure and control labour and the labour process. From simple software to sophisticated machine learning applications, these technologies are profoundly transforming labour in contemporary capitalism. Not least in the context of covid-19, the development and implementation of such technologies has been dynamic, in places substituting for stagnating attempts to automate labour (Schaupp 2022a).

The shape and impact of these forms of algorithmic management vary greatly across different companies, sectors, and locations. Thus, it is very hard to give a concise and encompassing overview of the impact of these technologies on labour. It is, however, possible to identify specific tendencies that come with the proliferation of algorithmic management. The goal of this paper is exactly this: To analyse and conceptualise such a tendency. I will argue that forms of algorithmic management that (at least partly) automate the management of labour often have specific effects on the composition of workforces: this automation and digital organisation of management allows for the increasingly flexible and efficient inclusion of heterogeneous workforces into labour processes and supply chains. Migration and mobility are crucial expressions of this heterogeneity, but more factors of demographic and spatio-temporal flexibility come into play. I will describe these effects and affordances of technologies of algorithmic management in the context of a “multiplication of labour” (Mezzadra and Neilson 2013).

Empirically, the paper draws from multi-year ethnographic and qualitative research in different parts of the platform economy: global crowd or cloud work as well the location-bound urban gig economy. Based on comprehensive qualitative research into different platforms, I will show how algorithmic management enables the tightly controlled and standardized cooperation of a huge number of platform workers who can come from different backgrounds, experiences, and situations and who are distributed throughout space. Digitally (and often automatically) managed and standardized work procedures allow for the quick inclusion and remote organisation as well as substitutability and fluctuation of workers and hence contribute to the flexibilization and heterogenization of labour. Based on research in the gig economy in particular sectors and geographical locations, the findings are of course limited in their range, however, as I will argue in the conclusion, the tendencies we can analyse here are observable way beyond the gig economy across the world of work in digital capitalism.

In the following, I will establish the terms algorithmic management and the multiplication of labour, before I move on to illustrate the interplay of these in the platform economy. The third part is focussed on the online gig economy and its global dynamics of distributed digital production, while the fourth part concentrates on the urban gig economy and the special role of migrant labour. In concluding, I shortly summarise and situate the findings.

## 2 ALGORITHMIC MANAGEMENT AND THE MULTIPLICATION OF LABOUR

With the term algorithmic management, I want to address a number of technologies designed to partly or completely automate organizational, coordination and control elements of the labour process (Lee et al. 2015; Moore 2017; Beverungen 2017). Instead of getting instructions and supervision directly from (middle) management, workers are given their orders and specifications via digital applications,

which manage, for example, workflows for office workers or navigation routes for delivery drivers. These forms of automated management are often helped by tracking, tracing, and rating and can use “nudging techniques” or elements of gamification. Algorithmic management is hence a broad – and somewhat imprecise – term bringing together a number of different techniques and technologies (Krzywdzinski and Gerber 2021). For the sake of this paper, this broad term shall suffice as I am particularly interested in the effects of automated (hence replicable and cheap/efficient on large scales) management which can indeed reach from direct control to gamified incentives.

Pioneered in but not limited to the gig economy, the extent of usage of algorithmic management varies across sectors and locations as well as the extent to which management processes are completely automated or human management works alongside and with the help of tools of digital management. While these forms of automated management certainly allow for new forms (and often a new granularity) of control over the labour process, they also have gaps and produce new forms and strategies of resistance by workers (Heiland 2022; Altenried and Niebler 2022). In many cases, it is not only (or not even primarily) the level or efficiency of direct control (which can be patchy or low), but the speed and cost-efficiency in the flexible inclusion of diverse workers into production processes that makes algorithmic management a factor in the transformation of work. Before looking at this empirically, I want to introduce the concept of the multiplication of labour to conceptualise this tendency.

Sandro Mezzadra and Brett Neilson describe the “multiplication of labour” as “the parallel operation of the three tendencies—intensification, diversification, and heterogenization of labor—that are increasingly reshaping labor experiences and conditions” (Mezzadra and Neilson 2013, 91-92). With the term, they strive to supplement the familiar term of the division of labour and hint at the heterogeneity of living labour in a time characterized by the increasing coalescing of labour and life, the increasing flexibilization of labour, as well as shifting overlapping production geographies in the ongoing processes of globalization. This centres not only the dynamics of migration in the production of labour markets but focusses on the “productive” role of borders in the constantly ongoing segmentation, fragmentation, temporalization of these markets and their overlapping and unstable borders in contemporary capitalism.

I would argue that the concept is also extremely effective in understanding major dynamics in the transformation of labour driven by digital technology (Altenried 2022). Digital technology, or, more precisely the standardization of tasks, the means of algorithmic management, and surveillance to organize the labour process, as well as the automated measuring of results and feedback often allow for a more efficient, temporal, and flexible inclusion of very heterogenous workforces into production processes. In other words, it is precisely the standardization of work that can profit from and allows for the multiplication of living labour in many ways. Looking at this from the perspective of the mobility of labour, it becomes crucial to research the interaction between algorithmic workplace regimes and migration regimes and how these are co-productive in the creation and transformation of segmented labour markets (Schaupp 2022b).

Platform labour illustrates this in a concentrated form. Here, for example, we can observe this multiplication quite literally in the sense that many combine two or more jobs, are logged into various apps and or combine wage labour and reproductive tasks at the same time. Beyond this first obvious dimension, digital platforms express many of the described tendencies of multiplication as they strive to flexibly and efficiently include workers (often addressed as independent contractors) from very heterogenous backgrounds, often for short amounts of time, into their production process precisely by automating large parts of the organisation and control of the labour process.

### 3 CROWDWORK: REMOTE ORGANISATION AND SPATIO-TEMPORAL FLEXIBILITY

I want to start the empirical part with a snapshot from my research on the online gig economy: A quote from Daniel, a crowdworker, I interviewed some years ago. He was 27 back then, a student and lived in Berlin-Wedding. He did crowdwork on a number of platforms to make ends meet. Talking about the ways he includes online platform work in his daily life he said: “Food in the oven— half an hour of working; if there is a break between two lectures, I’ll quickly write another text on curtains on my laptop.” He was supported by his parents, worked as student assistant and still needed €100-200 per months which he tried to earn on platforms whenever he had some free time to spare, his speciality being SEO-optimised product descriptions for online shops such as these curtains.

Today, the online gig economy, often also referred to as cloud or crowdwork, encompasses over two-thousand platforms such as Amazon Mechanical Turk, Freelancer, or Appen. These online labour platforms enact new forms of control and flexibility and serve as decentralized sites of digital production that are crucial to many nodes of the global economy, most notably the production and training of artificial intelligence (AI) (Altenried 2022; Gray and Suri 2019; Schmidt 2022). Training data for AI is only one, if nowadays the most dynamic, sector of crowdwork. Generally, these platforms outsource all kinds of digital work globally and we can see a huge variety between platforms, tasks, worker profiles as well as different forms of labour organisation and control (Krzywdzinski and Gerber 2020; Berg et al. 2018).

In the case of these platforms, the digital organisation and distribution of tasks, automated management, and surveillance and quality control allow for the inclusion of deeply heterogeneous workers without the need to spatially, temporally and subjectively homogenize them. Workers can access platforms from their homes, internet cafés, and even their mobile phones. In this way, the platforms are infrastructures opening up new labour pools previously difficult or impossible to reach as wage labourers and further diversify the workforce. The pause between lectures Daniel talked about is an example for this: a slice of time that has been previously unreachable for wage labour and can now almost seamlessly be integrated in a globally distributed but tightly (and automatically organised) production line. Another important example would be women with care responsibilities who combine reproductive tasks such as care for children or other relatives with crowdwork when they have a few hours or minutes to spare (Berg et al. 2018; Altenried and Wallis 2018; Wallis 2021).

Online platform labour folds onto existing economic geographies and transform them. Crowdwork has become, for example, important in locations with little alternatives in the labour market: from rural North America over urbanising Africa to refugee camps in Lebanon (Graham and Ferrari 2022; Hackl 2022), to name a few examples. Millions of digital home-based workers across the globe log daily into these platforms from their kitchens or living rooms to earn money from the tasks these platforms provide. Digital standardisation and algorithmic management as enacted by digital platforms make “work identifiable, searchable, and tradable at a truly planetary scale. Fixed material infrastructures of computing, international standards, and global payment systems allow the integration into broader systems of production of work that is broken into commodifiable chunks” as Fabian Ferrari and Mark Graham write (2022, 12). Even though the platforms workers come from very different backgrounds and situations and are located in vastly different geographical, cultural and temporal contexts, the algorithmic infrastructure of digital platforms synchronises their labour into a tightly organised production process.

## 4 URBAN GIG WORK: MIGRATION AND MOBILITY

With a second empirical snapshot, I want to move on to the location-bound gig economy providing services such as cleaning, cab rides or food delivery predominantly in urban areas. The urban gig economy provides a related yet particular impression of the dynamic interaction between automated management and the heterogenization of labour. In August of 2019, I interviewed Bastián, a Chilean food delivery rider in a park in Berlin-Neukölln. We were speaking about his decision to move to Berlin and how he started as a food delivery rider. “I always thought that it was an option working in Deliveroo, even when I was in Chile”, he told me. For him and many other young migrants working for gig economy platforms was a known option, even before they arrived in Berlin. Not only amongst the migrants from Chile and Argentina, most of whom come to Berlin on a one-year visa like Bastián, “it’s quite known that both Helpling and Deliveroo are the easy jobs to apply to when you come with a visa because you only have one year, and this is very immediately. They..., you don’t need that much papers, and you don’t need to speak German” as he explained.

The points he mentions already explain many of the reasons why gig economy platforms are a stronghold of migrant labour. Most platforms have a quick and unbureaucratic application process with very few formal requirements concerning qualifications, documents or skills. Many platforms even dispense with application interviews and only ask for a minimum of registration papers, work permits and similar documents and have few mechanisms to control the existence of these papers. For many (especially recent) migrants whose documentation, visa and permits would not suffice at other jobs, digital platforms are thus a quick way to start earning money.

Like Bastián, many migrant workers on digital platforms have numerous qualifications and degrees which are, however, often not accredited in Germany, a fact that contributes to protecting better-paid parts of the labour market against migrant workers. Another major and related problem for many migrants coming to Berlin is the German language. The availability even of precarious and low-skilled jobs becomes scarce and many find that their options diminish substantially without basic German skills. As the gig economy apps often work in several languages and are quite simple to operate, this offers possibilities even to those who speak no German or English.

The easy and quick accessibility of platforms like Deliveroo and the ability to earn money without the knowledge of the language makes those platforms important to many migrants especially in the time immediately after their arrival. As Bastián explained above, the option to work for such platforms is common knowledge among young people from Chile or Argentina wanting to come to Germany. In these cases, digital platforms become part of “migration infrastructures” as Biao Xiang and Johan Lindquist describe the “systematically interlinked technologies, institutions, and actors that facilitate and condition mobility” (Xiang and Lindquist 2014, 124; see also Altenried et al. 2018). While these platforms do not inhibit active brokerage positions such as labour agencies sending workers abroad, they enable new strategies, routes and pathways for migrant workers who base their mobility projects on platform labour and condition their differential, i.e. partial and temporal inclusion into national labour markets.

For platforms like Deliveroo, Helpling, Uber and many others, migrant workers constitute a crucial pool of workers forced to accept unstable and precarious conditions. While the importance of migrant labour especially to the service, gastronomy or taxi sectors of Berlin and many other cities is nothing new, digital platforms express a new special quality here. In fact, the labour model of the digital gig economy is geared almost perfectly towards the exploitation of migrant labour.

The systems of algorithmic management employed by the platforms via their apps allow for the (semi-)automated organisation and control of labour replacing, in large parts, human management while allowing for a new level of granular control and planning. Food delivery riders like Bastián, for example, need only minimal training, language skills or supervision as they are navigated by the app through urban space. These possibilities of digital and automated organisation, instruction and control make it possible and efficient for platforms, to hire workers who are new to a city and do not speak German or English, let them start working immediately and maybe let them go after a few weeks. In such cases, algorithmic management substitutes large amounts of training, forms of supervision, control or building of trust by human managers that would make it hugely in-efficient (and possibly risky) for corporations to hire such workers only for a few weeks or months.

In the case of digital platforms, these mechanisms of algorithmic management develop their effect and efficiency in combination with contingent labour arrangements, i.e. the forms of self-employment, short-term or zero-hour contracts, or sub-contracting models found in the platform economy. It is also this very combination that allows platforms to accept a high number of workers as there are few fixed costs and risks are outsourced to the workers. Under these conditions, a high fluctuation in the workforce is no problem but rather part of the calculation of the platforms that can count on a latent reserve army of (migrant) workers who can be allowed into and expelled from the platforms with minimal costs and problems.

Indeed, there are very similar tendencies and logics at play in many European cities and even globally: More often than not, the platforms' workforces are in their majority migrant workers (Altenried, Bojadžijev, and Wallis 2020, Altenried 2021, Ferrari, Graham, and Van Doorn 2020; Gebrial 2022; Greef 2019; Liu 2019; Das and Srravya C 2021). Looking at the ways platforms' recruitment strategies profit from stratified and segmented labour markets that create a multiplicity of migrant situations and a reserve army of workers for the platforms, it becomes clear that without migrant labour, there would be no gig economy as we know it.

## 5 CONCLUSION

I would argue that both examples show how technologies of algorithmic management (ranging from simple functions to AI applications and very complex software) in the ways they are used in the platform economy participate in a flexibilization and heterogenization of workforces that I have described as a multiplication of labour. This is a multifaceted process encompassing the level of global production geographies and the shifting division of labour as well as the everyday lives of platform workers.

Platforms serve as distributed "digital factories" (Altenried 2022) that can, as in the case of crowdwork, coordinate tens of thousands of spatially distributed digital workers into tightly and automatically organised production processes without the need, however, to temporally, spatially, or subjectively homogenise them as, say, a Fordist factory needed to do it. Most of today's urban gig platforms, on the other hand, are based on predominantly migrant and often highly mobile workforces whose quick, flexible and temporal inclusion into the platforms labour process is predicated upon technologies of automated management.

Clearly, platforms are very vivid example of these tendencies and particular development in the world of work. However, the tendency I have described as the interplay between algorithmic management and the multiplication of labour becomes visible across many sites and in different forms. In



Amazon's warehouses, to take an example from outside the gig economy, the various technologies of standardization and algorithmic management reduce training times and increase control possibilities, thereby allowing flexible and short-term solutions in the recruitment of labour to satisfy the contingencies of supply chains for business peaks such as the weeks before Christmas when the workforce in many warehouses doubles. Seasonal labour, short-term contracts, and outsourced labour are important components of the labour regime in Amazon's distribution centres and proliferating beyond Amazon across different sectors and locations where we could find many more examples for the interplay of algorithmic management and the multiplication of labour for which the gig economy is an important laboratory.

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