



Florian A. Schmidt

Digital Labour Markets in the Platform Economy

Mapping the Political Challenges of Crowd Work and Gig Work

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- New growth and a proactive economic and financial policy;
- Decent work and social progress.

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PREFACE

The so-called "sharing economy" is a much-debated topic. Uber, Airbnb, Helpling and many other platform-based business models want to "disrupt" industries that they portray as "ossified" and user-unfriendly. The contenders claim to create new services that are more flexible and cost-efficient. And indeed, the new platforms, which serve as an intermediary between supply and demand, have many valuable contributions to offer: they provide access to goods and services across the world within seconds; they lower transaction costs as well as expenditure for the allocation of resources; they enable a multitude of new services; and they are a driving force for economic innovation.

Nevertheless, the new platforms are increasingly beset by criticism. Usually they rely on a workforce of independent contractors, who work on their own account and at their own risk, for low wages and without social security. Neither the platform providers nor their clients take on the role and responsibilities of an employer. Labour laws, worker protection, health and safety regulations, quality of work and social security contributions mostly fall to the responsibility of the independent contractors alone, who are also not entitled to the kind of workers' participation common in other sectors. The clients of the platforms essentially gain access to an on-demand workforce, while the independent contractors who provide the labour are subject to precarious working conditions.

Against this background, the Friedrich-Ebert-Stiftung (FES) decided to have a closer look at platform-based digital business models and their implications for the economy and for society. While digital platforms have come to play a role in many branches of the economy, the present publication is focussed on the socio-politically most contested ones, namely digital labour platforms. The study explains the basic mechanisms of three-sided digital labour markets and compares its variants and subcategories. It also explains the specific features and challenges of the different categories and proposes starting points for political measures.

We wish you an interesting read!

DR. ROBERT PHILIPPS

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INTRODUCTION

The so-called "sharing economy" is gaining momentum. As of 2016, Airbnb is valued at US\$25.5 billion, while Uber is valued at US\$62.5 billion. The two companies, which are presented as engaged in the "sharing of underutilised assets" – the commercial brokering of accommodation and of transportation, respectively – are now among the most valuable start-ups on the market. Their massive accumulation of venture capital is driven by the investors' hope for new forms of value creation through the "disruption" of existing business models, which are often portrayed as ossified, overregulated and inefficient. In contrast to what the term "sharing economy" suggests, however, the large digital platforms in this area are not based primarily on the sharing of common goods but on the commercial coordination of various services offered by private individuals. This development gives employers access to a huge on-demand-workforce and is leading to a shift in the structure of labour markets. The emerging business models of what is best described as the "platform economy" rely on private individuals who, as independent contractors, carry out small jobs in their free time; an army of more or less precarious workers who can be hired or fired in an instant. Literally thousands of digital platforms for the commercial coordination of digital labour have emerged in recent years. However, at this point it is still uncertain how many of them are economically viable in the long run, and to what extent the new types of jobs will replace more conventional forms of employment.

Unfortunately, the discourse on platform-based digital labour often suffers from inconsistencies in the use of terminology and confusion in the categorisation of different platform types. In order to address at the appropriate level the multiple challenges our labour markets are faced with, it is important to differentiate between the new business models and to use a terminology that reflects this differentiation. The problem is not only a confusion of the different methods used by the digital labour platforms, but also the fact that the language used to describe them is dominated by marketing terms. People in the field commonly speak of "Turkers", "HITs", "awards" and the "cloud" instead of independent contractors, jobs, payment and someone else's data centre. However, it doesn't seem practical to avoid the neol-

ogisms entirely. Instead, this study takes the free-floating terminology and organises it along the lines of what is most pertinent for a political debate and the question of potential regulatory measures. In particular, the study distinguishes between "cloud work", "crowd work" and "gig work" as the three most important categories of digital labour. In order to understand the shifting labour landscape and take an active role in designing the future of work, it is furthermore necessary to look at these phenomena not in isolation but in the context of other platform-based business models, and also to recognise them as just the latest digital stage in a long on-going development towards more flexible, temporary and tentative forms of labour, with analogue predecessors in outsourcing companies and temporary employment agencies.

The new digital labour markets claim to be flexible, lean, and cost-efficient, for both their clients and their independent contractors. And cloud work, crowd work and gig work do indeed offer more and more people an attractive alternative to conventional full-time employment, a self-determined way of working – when, where, how, for whom and on whatever they want. However, this new flexibility often goes hand in hand with precarious working conditions and undermines hard-won legal and social standards of good work. The new platform-based business models portray themselves as the future of work and political terms such as "Arbeit 4.0" (literally: "Work 4.0", a term used frequently by German politicians) support this air of progressiveness. Nonetheless, with regard to workers' rights and social security, it seems that the new platforms instead represent a regression to the times of the early Industrial Revolution. This leads to the question of what can and should be done at the policy level. To what extent can regulatory measures protect workers' rights from being further diminished? How can it be ensured that the profits (or rents) made in the platform economy do not exclusively benefit venture capitalists and platform providers, but also those who do the actual work and, more importantly, bear the brunt of the entrepreneurial risk: in other words, the cloud workers, crowd workers and gig workers? And how can the on-demand digital labour model of the platform economy be prevented from causing damage to the public

good? After all, it is society that has to carry the social costs of all the precarious workers in the long run.

The quickly evolving platform-based reorganisation of work comes with a whole set of opportunities and risks. First, this demands a precise terminology and analysis of its functionalities. Secondly, a broad public debate is needed about what values society deems worth protecting and what constitutes decent work. Finally, it is the role of government to enforce the agreed-upon values through regulations and ensure that labour laws also apply in the digital realm. However, due to the structure of the platforms, this will be a serious challenge. The present publication offers first and foremost a categorisation of the different types of commercial digital labour platforms. It also discusses the particular characteristics and challenges of the different categories and maps how to tackle them politically.

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ABSTRACT

This policy paper offers a model for the categorisation of digital labour platforms, commercial providers of an on-demand workforce that consists mainly of private individuals trying to generate an additional income. Commons-based peer production and non-profit projects such as Wikipedia, OpenStreetMap and CouchSurfing, which are based on actual sharing, are excluded from this analysis. Academically, they have to be dealt with separately, and politically, they should be supported as non-commercial alternatives. Commercial retail platforms such as eBay and Amazon, app-stores, search engines, social networks and straightforward B2B-platforms are also beyond the scope of this study. However, the digital labour platforms are analysed as part of the much larger platform economy. The platform economy in general can be characterised as follows: it consists of online marketplaces that involve at least three parties. The platform provider serves as an intermediary that coordinates the supply and demand sides of the other two parties. This role as intermediary allows the platform provider to shift most of the costs, risks and liabilities to the other two parties. Typically, the platform provider does not have to cover the cost of labour or the means of production. The platform provider offers an entirely virtual service (just an app or a website) and can thus grow exponentially, without having to face production costs growing proportionally as well (very low marginal costs). The platform provider is also the only one of the three parties that has full access to and control over the data, processes and rules of the platform. The particular software architecture of the digital platform causes a systemic information asymmetry and, through that, a power asymmetry. Driven by venture capital and network effects, the platform economy is prone to foster the emergence of monopolies or at least oligarchies.

Two questions are essential for the categorisation of digital labour platforms: are the services and tasks coordinated via the platform bound to a specific location? And are these services and tasks bound to a specific person? Both aspects have far-reaching implications for how the platforms operate, the situation of the independent contractors, the legal framework that applies and potential regulatory measures.

The taxonomy suggested here is as follows: if the task is not location-based and can be done remotely via the internet, it is *cloud work*. If the task is not given to a specific individual but to an undefined group of people online, it is *crowd work*. If the task is further subdivided into tiny units for piecemeal work, each paid for with an equally tiny amount of money, it is *microtasking crowd work*. If in contrary the task cannot be subdivided but is solved in a redundant fashion, in parallel, by an entire crowd, while in the end only one result is used and paid for, it is *contest-based crowd work*. However, when a task has to be done at a specific location and time, by a specific person that is responsible for task, it is *gig work*. These location-based services are further differentiated by the degree of personal involvement necessary and the degree of opportunities and risks they entail for the independent contractor. As a result, one arrives at the following six basic types of digital labour platform.

Cloud work (web-based digital labour)

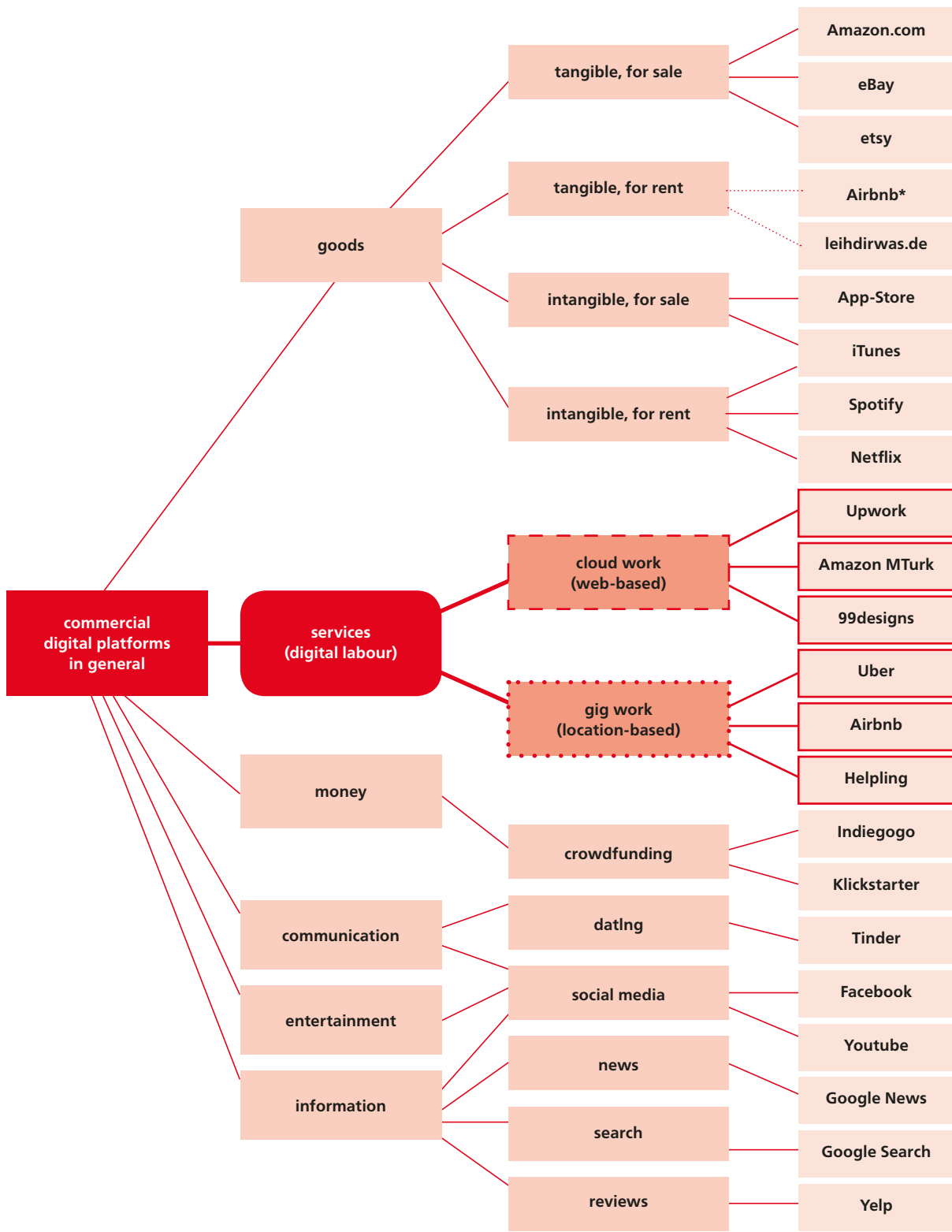
1. freelance marketplaces
2. microtasking crowd work
3. contest-based creative crowd work

Gig work (location-based digital labour)

4. accommodation
5. transportation and delivery services (gig work)
6. household services and personal services (gig work)

In practice, there are many hybrid platforms and further sub-categories. The categorisation suggested here is as simple as possible and as differentiated as necessary. The order of the six platform types listed above roughly represents the historical succession in which they have emerged. Within the first of three categories, a substantial market consolidation has already happened and a lot of research has already been done. The last three categories are more recent and especially the last one is still in the making and, as yet, not well understood. More research is needed, especially on the newer types of digital labour platforms, and a more refined differentiation of the types might become necessary in the future.

Figure 1
 Categorisation of digital labour markets
 in the platform economy 1/2

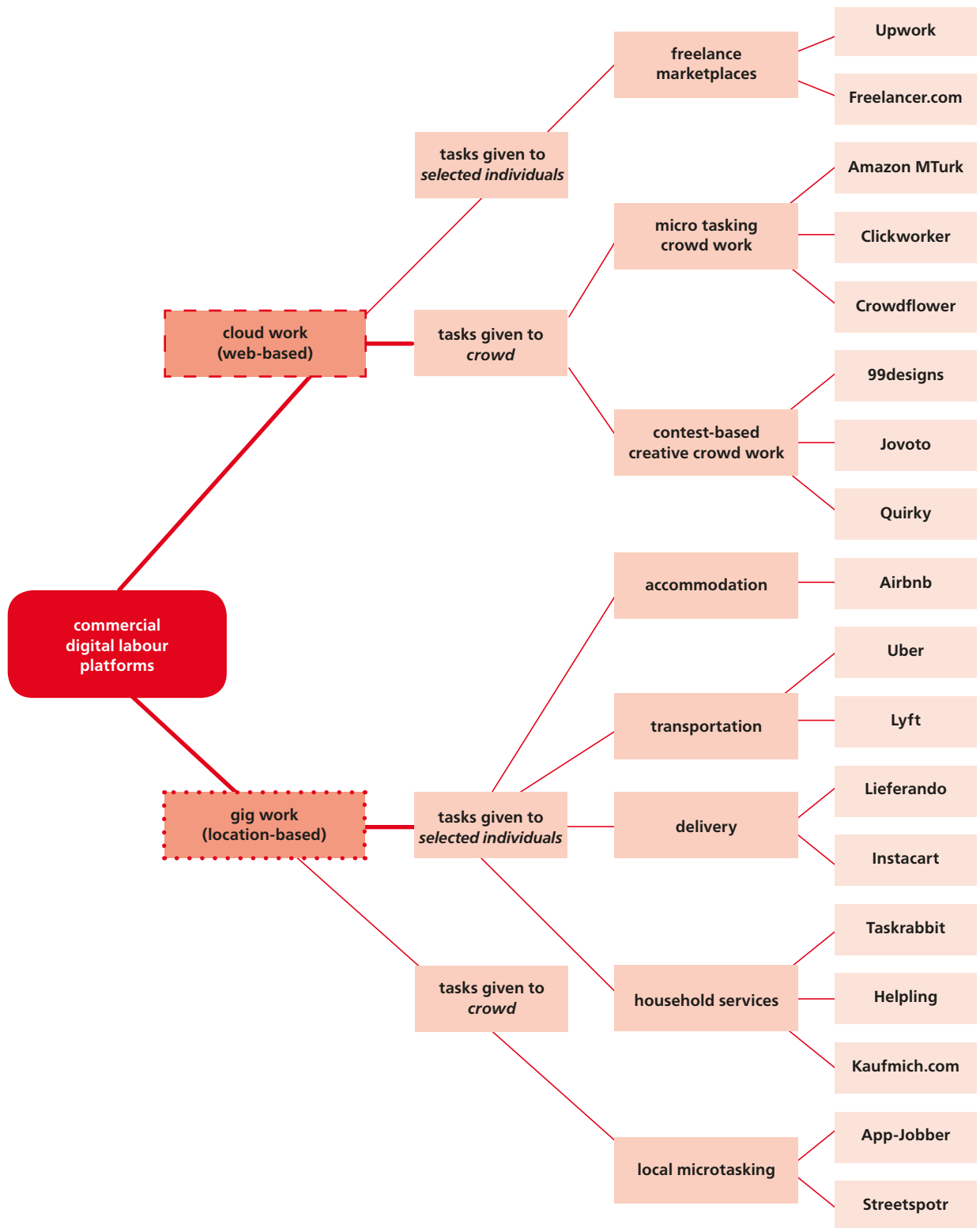


Important factors across all platform types are the emergence of monopolies, network effects, biased terms of service, lack of transparency, permanent tracking and rating of user behaviour, and lack of data protection – all of which have problematic consequences for digital labour platforms in particular.

* Because of its many structural similarities Airbnb is treated here as part of gig work, even though the role of labour is secondary on this particular platform.

Source: own research.

Figure 2
**Categorisation of digital labour markets
 in the platform economy 2/2**



To differentiate between digital labour platforms one has to ask: is the work bound to a specific place? And is the work bound to a specific individual? If it can be done from everywhere, it is cloud work. If it can be done by anyone and is given to an unspecific group, it is crowd work. Freelance marketplaces are therefore cloud work but not crowd work. If the work has to be done at a specific location and is given to one selected individual, it is gig work. Local microtasking is the only form of gig work given to a crowd.

Source: own research.

In all six categories we see political challenges with regard to issues such as privacy, data protection, labour laws, fair pay and the mechanisms of "algorithmic management" (the automated rating and tracking of independent contractors). The digital labour platforms for services that are not bound to a specific location (cloud work) – and of those especially the two forms of crowd work – are particularly difficult to regulate because it is not always clear which national legal standards apply if all three groups of stakeholders reside in different countries; this is a tricky question, especially in relation to the minimum wage. It is even questionable whether crowd work in its core sense is at all structurally compatible with a minimum wage or if regulatory measures with that goal would inevitably cause crowd work platforms to be transformed into freelance marketplaces, which would in turn be characterised by a much higher degree of worker surveillance.

Platforms for the outsourcing of location-based tasks (gig work) have turned out to be particularly disruptive because they affect a larger percentage of the workforce and much more capital in the form of physical assets is involved. On these platforms the risk of work accidents and potential harm to people and property is, of course, more pressing than on the web-based counterparts. As a consequence, the question of workers' compensation and liability insurance becomes important here. Furthermore, a lot more sensitive personal data are collected by the location-based services, as the gig workers (and, in the case of Uber, sometimes even the clients) are tracked via their smartphones. At the same time, the three types of gig work platforms operate on the level of cities and are much more visible than the web-based services. The gig work platforms clearly fall under the local legal framework; hence regulations are much more easily accomplished in these three groups and are already quite advanced in many jurisdictions. Also, the self-organisation of independent contractors, as well as the development of more socially spirited non-profits and platform cooperatives seem to be more promising for location-based services.

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ANALYSIS: LABOUR MARKETS IN THE PLATFORM ECONOMY

Platform-based business models have permeated many areas of society and commerce, from retailers of physical goods, via streaming services for music, film and video, to dating sites and apps. Digital platforms make the lives of millions of people easier and we can hardly imagine modern life without them any longer. Because they are so useful, important and omnipresent, a critical analysis of how they function is important. All the more so now that also labour markets are increasingly organised via digital platforms. Because these platforms operate on an international level, they pose a serious challenge for legislation, which usually operates only at a national level. The organisation of labour is a crucial question for society, and even though the shift of jobs from regular employment towards platform-based models for precarious self-employment is still in its early stages, the political implications of this shift can hardly be overestimated.

Since around 2005, digital platforms have become increasingly important, causing "disruptive" change in many industries. They pose a serious challenge, not only for established businesses, but also for the social state and its welfare systems. The potentially destructive force of the new platforms is rooted in the fact that they can be used to circumvent national laws for consumer protection, workers' rights, minimum wage regulations and social security contributions. Since the web-based platforms for cloud work and crowd work have evolved into the smartphone-based platforms for local gig work, the disruptive change is now becoming visible also in the physical world.

Digital platforms for the outsourcing of labour are of particular relevance because, on one hand, they allow for more flexible sources of income beyond conventional employment, while, on the other hand, they seem to be fostering a new class of precarious workers, a so-called "Cybertariat" (Huws 2003; Strube 2015). However, it is important not to look at the labour platforms in isolation but to see them as part of the larger platform economy. Therefore the analysis at hand first describes the functionality and structure of the platform economy in general (see Figure 1) before it focuses on the categorisation of digital labour platforms in particular (see Figure 2). The categorisation suggested here is a tree typology

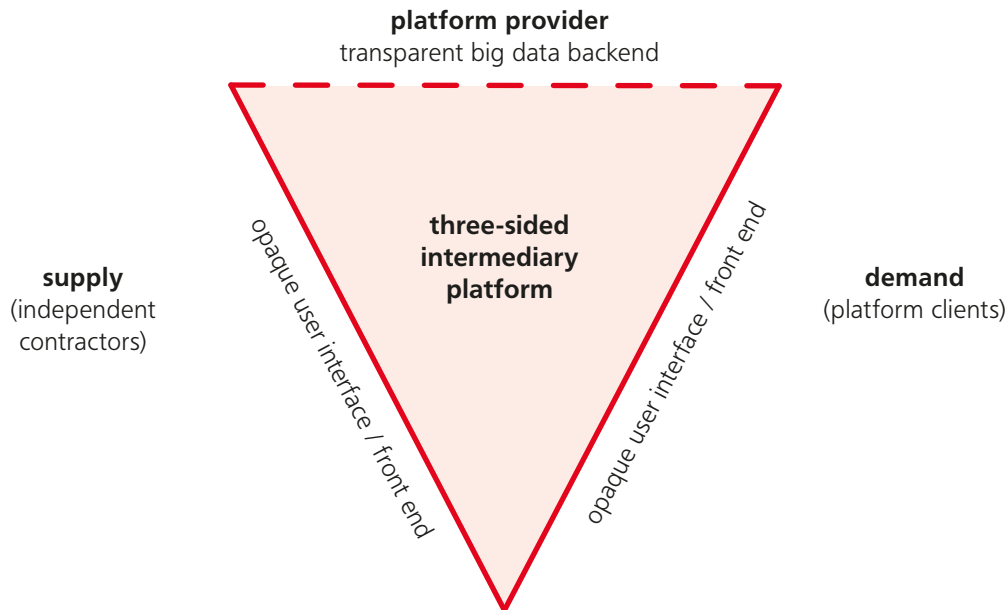
that makes it possible to locate the specific opportunities and risks of certain branches in the platform economy, as well as particular points at which to tackle these structures with political measures. In what follows these political measures will be discussed briefly. However the study understands itself mainly as a contribution to structuring the problem and its terminology.

The term "platform" proves to be particularly useful in this context because it points to the crucial structural similarity of various new digital business models and methods. It focuses on the mechanics of the infrastructure in the background and is less tainted by ideology or marketing. Elsewhere, also the term "platform capitalism" is used (Kenney 2014; Lobo 2014; Schmidt 2015), but in order to establish a more neutral vocabulary, the term "platform economy" is preferred in this study.

Commercial or Commons-based?

In order to categorise the vast amount of digital platforms, the first distinction that has to be made is between commercial and non-profit commons-based platforms. On platforms for commons-based peer production, collaboration is more important than competition and the fruits of labour are freely shared with everybody, including people outside the platform. Such platforms are part of the commons and it is crucial to distinguish them from the majority of platforms in the so-called "sharing economy" that in fact sail under false colours and pretend to be about sharing, while actually being about rent extraction or wage labour. In contrast to commercial platforms, the roles and interests of platform providers and users are not strictly separated within commons-based peer production. Users who are engaged in commons-based peer production projects can gradually gain influence over the structure of their platform and have a say in the rules that coordinate the collaboration between the different stakeholders (see Kelty 2008). Platforms such as Wikipedia, OpenStreetMap and CouchSurfing should therefore be politically protected and supported as an important alternative to commercial platforms. However, they are beyond the scope of this study.

Figure 3
Three-sided platform architecture



Source: own research.

Three-sidedness and Power Asymmetry

Economists define the structures under discussion here as two-sided markets or multi-sided platforms (Hagiu/Wright 2015). This means that there are always at least two other parties between which the platform-provider functions as intermediary. Thus, in these systems there are always three groups of stakeholders. In order to emphasise this crucial aspect, the study at hand speaks of three-sided platforms. The platform owners provide the infrastructure that mediates between supply and demand provided by the other two parties. When analysing a particular platform, one has to look closely at whether the platform provider facilitates the exchange between the other two stakeholders merely on a technical level – therefore serving as nothing more than a software company or infrastructure provider, as these companies often claim – or if they actually control the interaction between the other two parties, as is often the case with digital labour platforms. In the latter case, the question is whether these platforms effectively operate as temporary employment companies. This is relevant to the employment status of the workers and to the question of whether they might have been misclassified as independent contractors, while in fact being employees.

Typically, the software behind the commercial platforms runs in rented data centres ("the cloud") and has three sides of access. The users are divided into two opposing groups for supply and for demand, and both groups see different and very limited front-ends of the platform: small windows on the data and the processes of the system. The platform providers, however, have access to a back-end that gives them a comprehensive big-data overview of all the interactions between the two user groups, and they furthermore

have the power to influence the exchange between the other two and potentially do this in real-time. The platform providers control who sees what and when, what interactions between the other two are possible and under what conditions, and they wield this control technically, legally and via the design of the interface. Therefore, the typical platform is characterised by a systemic information and power asymmetry in favour of the platform providers. This structural imbalance in the architecture of the system could be countered only by decentralisation; a change that seems feasible for gig work but much less so for cloud work and crowd work.

The three-sidedness is also important because it allows the platform-providers to shift entrepreneurial risks, legal liabilities, the cost of labour and the means of production to the other two parties. The platform itself is an immaterial software product and as such it can potentially grow (or scale) exponentially without the providers having to spend proportionally more on staff or other costs of production (very low marginal costs). Depending on the area or industry in which the platform operates, it can often provide its service to one of the two user groups for free, as long as one group is willing to pay for the access to the other. This is the case, for example, with social networks and search engines.

Disruption, Economies of Scale and the Rise of Monopolies

It holds true for most platforms that the more people participate, the more useful they become for all users. These so-called network effects foster the rise of monopolies, or at least oligopolies, because from the perspective of the users, it is advantageous to opt for just one search engine, one so-

cial network, one online retailer and one online auction house. The result is a strong agglomeration of power in the hands of a small number of corporations.

The tendency towards power asymmetries and the emergence of oligopolies – rooted in network effects and the centralised, three-sided software architecture – is further enhanced by the role of venture capital. To attract investors, the platforms have to be "disruptive", meaning that they have to break up an established business model or industry and funnel its profits into the platform economy; the platform also has to be able to "scale" indefinitely. To achieve the exponential growth expected by the investors, the marginal costs of the product must be as low as possible, which in turn means that the product must be mainly virtual. This allows the platform providers to outsource the physical infrastructure and operate with a comparatively small staff. A few hundred employees are often enough to facilitate the business exchange between millions of users and take a cut of typically 20 to 30 per cent from every transaction between them.

Platforms for the mediation of paid services (digital labour) that are web-based and not bound to a specific location (cloud work) make their profit mainly from the labour of their independent contractors (even though the workers still have to pay for their computers and access to the internet as means of production). Platforms for the mediation of location-based tasks and services (gig work) – especially in the sectors of accommodation and transportation – integrate not only the labour of their independent contractors into their own value chain, but also their capital in the form of cars and homes. This is partly the reason why investments in gig work platforms, as well as the valuations of these companies, are so much higher than in the crowd work sector. Airbnb and Uber can challenge conventional companies in the hospitality and transportation industries, respectively, without having to own real estate for accommodation or a fleet of taxis, without having to pay for the maintenance of these capital goods and without being liable for the safety of the guests, the drivers or the service personnel. Only when seen from this perspective do the astronomical valuations of Airbnb (US\$25.5 billion) and Uber (US\$62.5 billion) begin to make sense.

The huge amounts of venture capital that the platform companies have raised are often used to finance an aggressive growth strategy that entails buying competitors and selling one's service under value for a while, in order to reach a critical mass of users before anybody else. The goal is a market penetration with network effects strong enough to keep the users on the platform even when, in order to break even, the terms of service are eventually changed, to the disadvantage of the users. Good examples are the changing privacy settings on Facebook, now affecting 1.6 billion users, or the changing rates for fares of Uber rides, which over time have become significantly less favourable for the drivers in order to benefit the platform (see Section 3.2.2).

Overreaching Terms of Service

While it is typically the case that centralised, multinational, venture capital-funded corporations control the back-end of

a commercial digital platform, the two parties at the front-ends are compartmentalised, fragmented and unorganised. Hence they have to negotiate from a position of weakness and this shows in the terms of service. The venture capital allows the platform providers, who are operating at an international level, to risk lawsuits at a national level – for example when being sued by workers, consumer advocates or the government for violation of local labour laws and regulations (Uber is the best example here). The problem of overreaching terms of service occurs in all areas of the platform economy. They are sprawling in terms of the sheer amount of text (with 55,000 words, Airbnb's terms of service have almost the length of a novel), they are often strongly biased against the users and they are supposed to apply to more and more areas of life. Contracts that formerly applied only to the relationship between a software product and its individual user now also apply to the interactions between the users, to their private and business relationships. This continuous expansion of the terms of service becomes particularly problematic in the domain of digital labour platforms, where the software licencing contracts have effectively evolved into work contracts. In the case of cloud work, the situation is further complicated by the fact that potentially all three parties of the platform triangle can – and often do – reside in different countries. The place of jurisdiction is usually the city in which the platform provider is registered, and the terms of service are usually written in an all-encompassing way that is supposed to be binding for millions of users across the globe. Obviously, this wholesale approach frequently collides with the national jurisdiction of the states in which the users reside. A discussion of these legal disputes is beyond the scope of this study. Instead, it must suffice to point to the work of the German employment law experts Thomas Klebe and Wolfgang Däubler, who have tackled these questions in detail (Klebe 2014 and 2016; Däubler 2015).

Algorithmic Management through Ratings and Tracking

It is one of the fundamental principles of the platform economy that production itself is not done by the platform provider, but by one of its two groups of users. To accomplish this, a lot of coordination is required from the platform provider, especially in order to sift through the flood of very heterogeneous contributions on the supply side, and in order to orchestrate the interactions of the users. To keep the marginal costs of production close to zero and ensure that the platform can grow exponentially, it is imperative for the platform providers to automate as many of these processes as possible. With only a small number of employees, they could not possibly deal with the millions of users personally. It is at this point where the interplay between "big data" and "algorithmic management" is brought into action (Lee et al. 2015); some also call this form of control "algocracy" (Aneesh 2009; Danaher 2016). Algorithms now do jobs previously done by middle managers, accountants and customer service representatives. And in the case of the digital labour platforms, human resource management is often outsourced to the users – especially in crowd work, where the individual workers self-assign their jobs. If the results do not match the clients'

expectations, the independent contractors are algorithmically rejected from future jobs, either entirely or from those above a certain threshold of quality or pay. This is done by blocking their account or by making certain jobs invisible to them at the front-end of the platform interface.

For many people, Amazon and eBay were the first places on the internet where they made business deals with strangers and afterwards publicly rated their satisfaction with their counterparty by awarding one to five stars. This method has become ubiquitous and is now also used for the management of the workforce on digital labour platforms. These ratings create trust between users who know nothing else about each other. They also make qualitative judgements between humans quantitative and thus machine-readable. Amazon and the users of its online warehouse heavily rely on the detailed product reviews written (without compensation) by its users. But only by reducing these judgements to five-star-ratings can they be sorted effectively by the platform. And it is this method that has become the standard for evaluating the performance of crowd workers and service personnel in the gig economy, too.

Ratings require the active participation of the users in an act of mutual evaluation that takes place after each completed interaction. Tracking in turn refers to the passive but continuous recording and evaluation of all user interactions, even very small ones. With its search engine, Google has shown how the tracking of user behaviour can be turned into a highly profitable business model. In a similar fashion, the detailed data that the platform providers continuously collect about the performance of their workforce – the knowledge about individual worker's thoroughness, industriousness and error rate – becomes an important asset; part of the capital of the platform providers.

Thanks to smartphones, the tracking and rating of customers, service personnel and independent contractors can now happen on the spot, face to face and in real time (Dzieza 2015). People assess each other's performance in the physical world immediately through actively rating the other (Holland 2016). And the platform providers can expand the tracking of the individual worker's efficiency on the platform itself to tracking their movements in space. On digital labour platforms, the aggregated ratings of workers de facto become their employment reference, while the constant tracking of their performance can amount to a fully automated curriculum vitae – a personal big-data sheet. This development brings up a number of tricky questions regarding the fairness and accuracy of these evaluations and it challenges the right to informational self-determination. Who should be allowed to access these big-data résumés? And is it – from the workers' perspective – worth striving for the possibility to make the personal big-data sheets transferrable from one digital labour platform to another, to not lose their hard-earned reputation when jumping platforms? Or would that be disadvantageous, because it would create the pressure to fully reveal one's complete data set when looking for a new platform provider or employer, even if the data might contain unfair or faulty evaluations? On digital labour platforms such as Amazon Mechanical Turk it has been a known problem for years that there is no proper dispute resolution policy if workers think either man or machine has rated them unfairly.

In order to ensure informational self-determination, workers would need a tool to monitor their big-data résumés, and the very heterogeneous digital labour platforms would have to agree on transferable standards or protocols, for example in the evaluation of reliability. The alternative would be to collect less data in the first place.

Gamification

Another mechanism for the automated coordination of large groups of users, or workers, in the case of digital labour platforms, is so-called "gamification". This tool of algorithmic management is made possible with data from ratings and tracking. It's a technique that allows platform providers to reward favourable user behaviour by awarding virtual credit points and by ranking the users' performance on public leaderboards. The awarded points often serve as a pseudo currency within the reputation economy of one platform, but they cannot be transferred to another. Gamification transforms wage labour into a game, in an often manipulative, behaviouristic manner. The basic principle is not new; analogue precursors of gamification include military medals or employee-of-the-month schemes. What is new is that, through rating and tracking on digital labour platforms, even the tiniest actions and utterances, down to the level of single mouse clicks, key strokes and scrolling behaviour, can be monitored and influenced through gamification. In contemporary video games, such as *Grand Theft Auto V*, one can already get a glimpse of how this development could play out for the workplace and the résumés of the future. Menus list hundreds of categories with statistical data on how often, how long, how fast and how accurate the player has solved specific tasks. Even the most minute actions are rewarded with "awards" and "achievements" and have their own leaderboards to compare the performance of different players. This type of data not only serves to motivate gamers or workers, respectively, but it is also a treasure trove of information for the digital labour platforms (see Section 3.1.1.). What's more, the Chinese government in collaboration with the Chinese shopping platform Alibaba is currently rolling out a project that shows how serious and politically relevant the role of gamification in the platform economy is. Under the name "Sesame Credit", it has introduced a public, individual "citizen score", based on factors such as shopping behaviour, credit history and the social circles of individual citizens, in order to reward political obedience and publically shame potential deviants. From 2020 onwards, China plans to make participation in the scheme mandatory for its citizens (Hatton 2015).

The Blurring Lines between Work and Play

Within the platform economy in general (beyond the dedicated digital labour platforms) it is often difficult to define what exactly counts as "work". As already mentioned, the business models are based on letting the users take care of the production. Is it therefore appropriate to demand wages for users of social networking platforms such as Facebook, as some activists do (see: Lanier 2014; Ptak 2013)? And what about online games such as *World of Warcraft*,

where in endless hours of piecework, amateur players, side by side with professional "goldfarmers", produce and accumulate virtual goods of tremendous real-world exchange value? How are we to deal with the fact that exactly the same action can be recreational play for one person and precarious work for another? This is not a trivial or purely academic question, given that through gamification work is actively being transformed into a game on some platforms. It's a challenge for regulatory measures in this field to distinguish digital labour platforms disguised as games from games that are misappropriated as precarious workplaces.

Nevertheless, there are two fundamental differences between the indistinct forms of work in the context of user-generated content in the wider platform economy and those on dedicated labour platforms: the production of user-generated content is typically self-initiated and intrinsically motivated. Writing blog posts and product reviews, uploading photos to Instagram or videos to YouTube, is all obviously based on a lot of work. But this work is done without assignment or brief, without any deadlines or specific demands by a third party defining what should be produced, when and how. The same is true for all the content that is produced as a by-product of communication on social networking sites. And because production of user-generated content is usually not reimbursed (at best only indirectly through advertising), there is not a new class of precarious workers emerging in this area, which is the concern (and to some extent already the case) with the dedicated digital labour platforms. The question of regulatory measures is therefore more pertinent in the case of those platforms that explicitly provide work to independent contractors, work that is not just perceived as a hobby or as spare-time occupation, but as a job that is done according to the demands of an employer or contracting entity and with the intent to realise a profit.

Flexibilisation and Atomisation of Labour

The most important promise that digital labour platforms make to their workforce, as well as to their clients is flexibility. Independent contractors are available "on-demand" as a "contingent workforce"; they are hired for specific tasks only and are dismissed as soon as the job is done.¹ In return, the independent contractors can work whenever, however, for whomever and as much or little as they want, as long as there are enough suitable tasks available and there are not too many competitors trying to do the same jobs. The entry barriers for cloud work, crowd work and gig work are extremely low, so that even marginalised groups can potentially find work immediately; the only prerequisites are that they accept the terms of service and have a fast and stable internet connection. This is a huge opportunity for people outside conventional career paths, without certain qualifications, with little education or work experience; but also for people who

cannot hold a full-time job because of personal health issues or because they have to take care of a family member; and, in the case of cloud work, also for people who either live in regions without jobs, or choose to work as "digital nomads" from abroad while travelling. There were (Txteagle) and are (Samasource) even attempts to hire people in refugee camps in the Global South as translators, asking them to translate texts line by line via text messages on mobile phones.

Digital labour's enormous flexibility is partly enabled by the Tayloristic breakdown of what were once occupations into their smallest possible components. Jobs become projects, then gigs and tasks and eventually microtasks. The units of time and payment are broken down into seconds and cents and the independent contractors switch from one client to another with ever-higher frequency. The fine granularity of tasks has the effect that both groups are willing to take more risks with regard to the likelihood of getting paid and the quality of the results respectively, because when one in a succession of microtasks goes wrong for either side, the damage that such an individual incident can cause is almost insignificant. The aggrieved party has merely lost a tiny amount of money or time. In the aggregate, however, these losses become a problem, especially when the uncertainty of getting paid for work already done becomes the new norm. The tiny values in dispute also have the effect that workers on digital labour platforms are usually not willing to go to court to sue the other party for compensation (or the platform providers for their legally questionable terms of service).

The question is, how established standards of labour law and social security can be sustained if what constitutes a job is cut into smaller and smaller tasks with uncertain pay? What is the legal status of people working under these conditions? Almost all platforms for digital labour state in their terms of service that the workers are independent contractors, as well as that, because they are "self-employed", it is also up to them to take care of all social security contributions. But is that a realistic description of those cases in which, although the clients might change from minute to minute, the independent contractors work continuously for the same platform provider, which in turn exerts strong influence over how exactly the work must be done and what is paid for it? Here the question is whether the independent contractors are in fact misclassified employees of the platform. So far there have been a number of class action lawsuits, mainly in the United States, in which crowd workers and gig workers have sued their platform providers in order to retroactively demand the minimum wage they would have been entitled to as regular employees. In the context of crowd work, there was a prominent lawsuit against CrowdFlower and, in the context of gig work, against Uber (see Cherry 2016; Seiner 2017). For the platform providers these class action lawsuits pose an imminent threat to their business model, but to date they have been able to resolve them through multi-million dollar settlements. That also means that the legal situation remains unresolved.

¹ In the words of Lukas Biewald, CEO of CrowdFlower: "Before the Internet, it would be really difficult to find someone, sit them down for ten minutes and get them to work for you, and then fire them after those ten minutes. But with technology, you can actually find them, pay them the tiny amount of money, and then get rid of them when you don't need them anymore" (Marvit 2014).

3.1. PLATFORMS FOR WEB-BASED SERVICES (CLOUD WORK)

3.1.1 FREELANCE MARKETPLACES

Freelance marketplaces (sometimes also referred to as on-line outsourcing, outsourcing marketplaces or the online staffing industry) transfer the principle of outsourcing from the level of companies to that of individuals. Clients can find independent contractors abroad via these platforms and the latter can in turn bid for the advertised jobs. In principle, all three parties in the platform triangle can be based in different countries across the world, which, as mentioned earlier, is a tricky complication with regard to the applicable legal jurisdiction.

Upwork, one of the largest platform providers in this area, explicitly advertises its service within the framework of the lifestyle choice of becoming a "digital nomad", a creative, well-educated online worker travelling the world, able to earn money at the beach or from the side of the pool. All it takes is a laptop and a fast internet connection.² This type of digital labour platform always falls into the category of cloud work, but it is typically not crowd work.³ The important difference is that on the freelance marketplaces' clients hand-pick independent contractors based on their skills; the payment is negotiated individually in the end; and only one person is eventually going to do the job. Freelance marketplaces have millions of independent contractors as users and huge revenues and have been in existence for over a decade: eLance was founded as early as 1999, oDesk in 2003 and Freelancer.com in 2009. In 2013, the former two merged into eLance-oDesk, and since 2015 they have traded under the name "Upwork". The Silicon Valley-based company now claims to have 9 million registered freelancers, 4 million clients and a turnover of US\$1 billion per year. After merging with several smaller providers, Freelancer.com, Upwork's biggest competitor, now claims to have 20 million registered workers, who so far have finished 9 million jobs (which also means that the majority of registered contractors never got a job via the platform). It must be noted that the user numbers published by platform providers are generally not very reliable; the platforms typically publicise only the total number of people who have ever registered, in order to appear larger than their competitors. The number of active users is always much smaller and follows a "long tail" or Pareto distribution – only a small number of "power-users" (between 1 and 10 per cent) accomplishes the majority of all jobs on the platform. Most users who create an account are active only sporadically or not at all. In order to evaluate the size of a platform, revenue figures or the number of finished jobs are much more significant.

The types of jobs mediated via freelance marketplaces are very heterogeneous, but in contrast to microtasking (which will be discussed the next section) the tasks are relatively complex, demanding, specialised, technical and often

relatively well paid. In 2013 oDesk published a graph that showed the distribution of job types on offer.⁴ Search engine optimisation (SEO) was in the lead, followed by jobs in software and web development; but also jobs in marketing, design, writing, legal services and engineering were featured in the spectrum.

For mediating between supply and demand, freelance marketplaces typically charge a fee of 10 to 20 per cent from the independent contractors. For clients the service is often free. Even though the available data on the subject are limited, it seems that the freelancers on these platforms are comparatively satisfied (Leimeister et al. 2016). In contrast to the neighbouring fields of crowd work and gig work, there is no larger debate around the potential exploitation of workers in this area of the platform economy. It seems that there has been little demand for political regulation so far. However, there are two critical aspects in the functionality of freelance marketplaces that are of great relevance for all digital labour platforms.

First, on these outsourcing sites individual contractors have to compete with each other globally, and through the practice of bidding there is the danger of entering a race to the bottom for common tasks. How cheaply one can offer a service depends partly on one's cost of living but more importantly on one's degree of specialisation. The more specialised a skill is the less it is in danger of a deterioration in prices caused by global competition. For freelancers in the Global North, it will be less and less profitable to offer services that can be done just as well via the internet by people from the Global South. This development also affects skilful but routine tasks, such as the analysis of medical X-ray imagery (Sharma 2014).

Secondly, the freelance marketplaces are characterised by a relatively high level of surveillance. Upwork, for example, uses a software application called "Work Diary" to allow clients to virtually look over the shoulders of their independent contractors. Six times per hour and at random intervals, the software takes screenshots of the freelancers' computer. In this way the client can ensure that the contractors stay on task, instead of, say, checking in on Facebook while being on the clock. Furthermore, the Work Diary also tracks the number of mouse clicks and keystrokes and even makes webcam photos of the independent contractors – who can, however, refuse clients the permission to use this feature.⁵ In addition, Upwork states in its terms of service: "We will share information contained in Work Diaries with the relevant client and with any manager or administrator of any applicable Freelancer Agency." It is made clear that as a freelancer, one has little control over the data gathered on one's work behaviour. The extraordinary degree of freedom on digital labour platforms such as Upwork is accompanied by an extraordinary degree of control. Interestingly, industrious workers often welcome this form of surveillance, because it allows them to demonstrate their reliability and therefore justifies their comparatively high hourly rates.

² See: <https://www.upwork.com/blog/category/digital-nomads/>.

³ Although some freelance marketplaces also offer crowd work as an alternative mode to outsource work.

⁴ See: <https://content-static.upwork.com/blog/uploads/sites/4/2013/08/LongtailSkillsChart.jpg>.

⁵ See: <https://www.upwork.com/legal/privacy/#work-diaries>.

3.1.2 MICROTASKING (CROWDWORK)

There are essentially two basic types of commercial, paid crowd work: microtasking crowd work and contest-based creative crowd work (see Section 3.1.3). Microtasking is probably best circumscribed in terms of "cognitive piecework", a phrase introduced by crowd work researcher Lilly Irani; microtasking pioneer Luis von Ahn calls it "human computation". Microtasking involves masses of tiny, repetitive tasks that are distributed across a large and unspecified group of crowd workers. The workers self-assign to the tasks and are assumed to be generally unskilled (for that task) and therefore interchangeable.⁶ The processing of the tasks is automated as much as possible; the organisation resembles that of a conveyor belt production line and clients as well as crowd workers often remain anonymous to each other. Many of the tasks revolve around data processing problems that can best be solved by human cognition, but the results of which can be evaluated and assembled by a computer. The principles of microtasking have a lot in common with the methods once described in Frederick Taylor's *Scientific Management*.

The organisation of labour as microtasking forms an interdependent relationship with automation. Many of the tasks in question are likely to be automated in the near future. Crowd work researcher Mary L. Gray, of Microsoft Research, describes microtasking as the "last mile of automation"; it concerns the residual tasks of larger data processing operations that unskilled humans can still solve more cheaply and with a lower error rate than computers. It is likely that stricter regulations regarding the labour conditions on microtasking platforms would accelerate the trend towards automation of these tasks. Crowdworkers in the field of microtasking are already training the machines that are supposed to replace them. In turn, progress in machine learning is heavily dependent on crowdworkers to create original data sets that the machines can learn from.

Other typical forms of microtasking include: the validation of existing databases, for example of company addresses; the digitisation of business cards (now already mostly automated); the transcription of audio recordings; the writing of product descriptions; sentiment analysis; and, last but not least, content moderation. All the user-generated content uploaded to social media sites has to be checked – at least if it was flagged by other users – to see whether it is harmless and in accordance with the terms of service. It demands human value judgement to recognise real violence, hate speech, pornography or simply female nipples (in the case of Facebook) to distinguish them from depictions accepted by the platform and to censor transgressions. A lot of this work is done in countries such as the Philippines, by crowdworkers who, because of the shocking content that people upload (for example, IS propaganda videos of beheadings), sometimes even develop post-traumatic stress disorders (Chen 2014).

⁶ The different platform types for digital labour are described here deliberately with a broad brush to make visible their prototypical characteristics. In reality, there are many hybrid forms of platform and great diversity among the people who work there. Crowdworkers are often highly educated.

Amazon played a key role in the development of modern microtasking. Originally, the company was looking for a way to synchronise or remove redundant entries in the catalogue of its online warehouse. This, too, is a task that humans can solve much better than computers and Amazon has started to pay unskilled people small amounts for this work. In 2005, the company made its new outsourcing method available to external clients and called the service the "Amazon Mechanical Turk" (MTurk). The company is tight-lipped when it comes to MTurk, but it is assumed that about half a million people work on the platform. The workers come from various countries, but for a few years only people from India and the United States could apply, and they form the majority of the so-called "Turkers". Crowdworkers from other countries are not paid with money but in Amazon vouchers. Since 2016, the platform has accepted workers from Germany and other countries again.

In comparison with its competitors, MTurk is fairly small. With about 700,000 registered crowdworkers, the German company Clickworker.com, founded in Essen in 2005, has the same order of magnitude. But the Silicon Valley-based company CrowdFlower, financed with US\$28 million in venture capital, has about 5 million crowdworkers, coordinated by just a hundred employees.⁷ Nevertheless, most studies on microtasking so far have focussed on MTurk, which is also why the following examples are mostly from Amazon's platform.

Amazon describes its form of crowdwork as "Human Intelligence Tasks" or HITs. The principle is sometimes also referred to as "humans-as-a-service", following the wording of similar offerings such as "software-as-a-service". Just as clients can rent data storage or processing power from Amazon, they can also rent human brainpower. Tellingly, the name "Mechanical Turk" is a reference to a historical eighteenth-century chess robot hoax, which involved a human hiding in the apparatus, pretending to be a smart machine. The point is that Amazon allows its clients to address the crowdworkers as if they were merely machine parts, not with their real name but as anonymous, numbered processing units. And being dehumanised by the platform is indeed the grievance most often articulated by the so-called "Turkers" (see: Irani 2013, 2015). In 2015 a group of Turkers even wrote an open letter to Amazon CEO Jeff Bezos to remind him that crowdworkers are flesh and blood humans who want to be treated with fairness and respect (Salehi et al. 2015).

From the clients' perspective, the invisibility of the workers in microtasking is not a bug but a feature. This cannot be altered without a significant loss in efficiency and it is an important difference from the freelance marketplaces, where the clients handpick the workers and then want to virtually look over their shoulders. In microtasking, the units of work and the reimbursements are so small that it would neither be practical nor economically feasible to deal with contractors on an individual level. Instead, the workforce is dealt with in the aggregate – as a crowd – which leads to the next points of criticism regarding this specific form of digi-

⁷ See: <https://www.crunchbase.com/organization/crowdfLOWER#/entity>.

tal labour: very low and uncertain payment, and no orderly conflict resolution for the workers in the case of unfair treatment and unpaid wages. Here, the consequences of algorithmic management come into full effect. Microtaskers don't have a boss who assigns them to specific tasks, controls the process and approves the results. Instead, the workers self-assign and everything else is done automatically; for example, by letting the computer compare the results of five different workers who have completed the same task. If the result of one person differs from those of the other four, it is considered to be wrong and the worker will not get paid. It does happen though, that a worker hands in a result that differs from the others because he or she has done the task more meticulously. If the task is rejected, there is no person on the other side that the worker could complain to about the mistreatment. Such a channel of communication would be important for the workers, but in relation to the size of the tasks, it would be too expensive for the client (see Kittur et al. 2013). Amazon therefore lays down in its terms of service that the client does not have to pay for rejected results, but is allowed to use them anyway. Critics regard this as an invitation to wage theft (see: Scholz 2015). It has grave consequences for the ratings of the independent contractor if results are rejected, no matter whether by an algorithm or by the client directly. The worker will be automatically excluded from future jobs if their overall ratings fall under a certain threshold; this is sometimes referred to as being fired by algorithm.

Prototypical crowd work (including contest-based creative crowd work, see next section) is characterised by a mutual lack of responsibility. In principle, crowdworkers have the freedom to self-assign to any job without qualifications; they can quit working in the middle of a task, without having to answer to anyone for their decisions or their results. In turn, the clients are not responsible to answer questions from the workers or to guarantee payment for work that is done under these conditions. The lack of responsibility on the client's side is often criticised, but when advocating minimum wages for crowdworkers, one has to take into consideration that both sides have very few obligations. If regulations forced clients to pay minimum amounts of money – either for the time workers invest or per task – they would indirectly be forced to control more strictly who is allowed to work on a task in the first place. The clients would have to demand previous qualifications and monitor the work process and the results more strictly, to ensure that they actually get what they are paying for. Regulations aiming for a minimum wage would therefore very likely force the crowd-work platforms to become more like freelance marketplaces. The quid pro quo of the extraordinary degree of freedom that crowdworkers currently enjoy is uncertain and low wages. If labour unions or the government want to improve the working conditions, while maintaining this high degree of freedom, as well as the low entry barriers, they will have to decide what is the lesser evil: uncertain and low pay (as on MTurk) or total surveillance of the work process (as in Upwork's Worker Diary).

The mutual lack of responsibility in crowd work is accompanied by a mutual lack of trust. This is especially pronounced in microtasking, where the clients and workers are typically anonymous to each other (though not to the platform). And

indeed, the lack of trust is to some extent justified. In both groups of users one finds actors that are unreliable – workers that overestimate their capabilities when self-assigning to a task and clients that provide faulty task descriptions that inevitably cause errors in the process. In addition to these accidental failures, there are also cases of deliberate fraud on both sides. The economic and technical feasibility of crowd work depends on the workers not being handpicked and individually controlled. If the clients were legally obliged to pay for each and every result produced under these conditions – as fairness towards honest workers would demand – fraudsters and dabblers would take advantage of this and inevitably force the clients into stricter pre-selection, more surveillance and human quality control of the end-results. Maybe, for regulatory purposes, this is the right way to go, but it would no longer be crowd work if the workers were individually selected in advance. And if a channel of communication for disputing rejected tasks was mandatory, the work would become so expensive that the process would be feasible only for bigger, more valuable tasks.

Finally, we should mention that there are a number of platforms that at first sight do not look like microtasking, because the jobs are much bigger, for example testing software and writing bug reports (for example, Testbirds). Because a lot of this work is done via smartphone apps, it is sometimes referred to as "mobile crowdwork". But because it is still outsourced en masse and the results can be evaluated objectively and automatically, they are considered here as part of microtasking. Furthermore, there are platforms for location-based microtasking (for example, Streetspotr), where the job is for example to take photos of how products are displayed in stores. These jobs are location-based, like gig work, but they are bound neither to a specific person nor to a specific time when they have to be accomplished, and are thus best treated as a form of microtasking crowd work.

3.1.3 CONTEST-BASED CREATIVE CROWD WORK

The largest digital labour platforms that organise work in the form of contests can be found in the domain of graphic design; more specifically, logo design. Since 2008, a number of these platforms have emerged, the largest of which is 99designs from Sidney, Australia. As of 2016, about 1.3 million registered users contribute solutions to design tasks on 99designs. On average, they upload a new design to the platform every 2.5 seconds, which is about 1 million designs per month. In total, the platform has paid out 125 million euros in half a million contests (as of March 2016). Thus, the average amount of money paid per contest is 250 euros. However, on average the crowd hands in 100 designs per contest, which brings down the average pay per design to 2.50 euros, far below the minimum wage.

The method of using creativity contests to organise work is by no means restricted to logo design. It covers a spectrum that also includes more complex tasks, such as web design, the development of marketing campaigns and open innovation projects for large companies (Jovoto), the conception and design of new physical products (Quirky), and even vehicle design (Local Motors). Because of the structural simi-

larities, also platforms for research and development tasks outside the immediate design domain, such as InnoCentive (founded as early as 2001) are considered here as part of contest-based creative crowd work.

In contrast to freelance marketplaces and microtasking platforms, the clients who use contest-based creative crowd work are in search for the best possible solution out of a very heterogeneous pool of possible solutions developed by the crowd specifically for that client. Typically, only one solution is needed, selected and paid for – all others are discarded. Therefore, the amount of work done redundantly, in vain and without pay is very high – and this is also the most heavily criticised aspect of this platform type. If not chosen by the client, the participating creatives typically keep the copyright to their solutions, but because the ideas and concepts are custom-made for the client, they become useless if discarded in the contest. For the clients, however, also the discarded solutions contribute to the decision-making process and thus provide a value that they don't have to pay for. Some of the platforms even explicitly advertise their service with the promise to provide clients with free labour. The logo design platform Zenlayout.com, for example, advertises its service with the claim: "Run a Logo Design Contest. Hire 700 Designers. Pay One."

Contest-based creative crowd work is understood here as a subcategory of cloud work and crowd work, and as part of the value chain in commercial product development. This excludes creativity contests conducted to support and award creative talent for its own sake and also contests conducted merely for marketing purposes – for example when a company conducts a one-off amateur painting contest among its customers, where the actual results are only of secondary interest to the company. It also excludes the common practice of professional pitches, in which a number of professionals compete by handing in proposals in order to get the commission for a bigger project. In contest-based creative crowd work the participants have to hand in finished designs. Because the work is done completely in advance, this form of labour is sometimes also referred to as speculative or "spec work". Some companies also conduct in-house crowd contests, or organise them as a one-off event without an external platform as an intermediary. For these borderline cases there seems to be no immediate need for political action or regulations because they do not create a new class of precarious cloud workers and thus have comparatively few consequences for the labour market in general.

Contest-based crowd work on commercial digital labour platforms is a different matter. Such platforms have evolved into an industry that is systematically and continuously outsourcing work hitherto done by regularly paid professionals to a "standing army" of crowd workers, for whom it has made the possibility of fair payment into a gamble.

The choice of the contest as prime method for organising creative crowd work is by no means arbitrary; it is the immediate consequence of the type of task. Creative tasks can typically not be subdivided into microtasks and an algorithm cannot do the evaluation of the results. The results are neither right nor wrong, but are on a spectrum of better or less well suited. Their value cannot be quantified objectively, but is often subject to the client's individual taste. The core fea-

ture of creative and innovative work is that the results have to be new, which means that the client does not know in advance what the sought-after solution is supposed to look like. The quality of an idea can be independent of the amount of time that a creative worker invests in it. A brilliant idea can come from a flash of inspiration, as well as from weeks of hard work. But the latter is no guarantee of a good idea. Therefore, it is impractical for creative work to establish a form of reimbursement based on the amount of time invested. Slow workers would be paid much better than ingenious ones. But it is equally impractical to guarantee a payment for every idea that is handed in, because then the client would have to pay even for the worst ideas that the crowd comes up with. If regulators want to leave intact the core principles of what a crowd is (open to everyone, no prior qualifications needed), while also pushing for a minimum wage (be it per time spent or per solution provided), the clients would inevitably have to pay for many inferior solutions. As with microtasking, such political intervention would probably cause creativity contests structurally to become more like freelance marketplaces, with pre-selection of workers and surveillance of the work process.

As mentioned above, creative tasks do not lend themselves to being subdivided and automated, but they are especially well suited for outsourcing via a crowd contest. This has a number of reasons: creative work is held in relatively high social esteem, especially if compared with the type of jobs available in microtasking. Many people experience creative work as intrinsically rewarding, see it as a dream job and become passionate amateurs. This group of creative crowdworkers do not expect to get paid properly, even if they provide solutions of professional quality. In addition, many creative crowdworkers endure the low and precarious pay on the platforms because they hope to professionalise themselves in the process. While the unskilled, piecemeal work of microtasking is reminiscent of labour on a conveyor belt, contest-based creative work resembles unpaid or severely underpaid internships in the creative industries. Microtasking is not a profession and has no career to offer. Participation in contest-based crowd work, however, is driven by the hope of entering a fulfilling line of work, of learning skills with value outside the platform. For each individual this possibility exists, but for the majority of the crowd it is unlikely. By definition, only a few can stand out from the crowd; everybody else is interchangeable.

All this leads to an interesting inversion with regard to the visibility of crowdworkers. In microtasking, they suffer from the fact that they are not perceived as individuals and practically remain invisible. In contest-based creative crowdwork, by contrast, they have to invest a lot of their personality in building a personal reputation and a public portfolio. The work they have done in previous contests is very visible and can easily be judged by clients and colleagues. This high visibility entices many to invest more time, effort and personality into the design projects than would be economically reasonable, given that the chances of eventually getting paid are slim. In contrast to microtasking, it is important for creative crowdworkers to create a personal connection to the client and to come across as friendly, attentive, service-oriented, even servile – but also as innovative thinkers able to

provide unique ideas. For the success of creative crowdworkers, the display of a winning personality is almost as important as the results. The working conditions are therefore comparatively emotional and the frustration is high if, despite the high level of engagement, the win-ratio is too low.

In parallel to this engaged and virtuous, but economically risky way of working, it is also a common strategy among creative crowd workers, especially on the logo platforms, to cut corners and reduce the time invested in a contest by more or less blatant plagiarism, for example by taking existing graphics from elsewhere on the internet and altering them only slightly. For the clients, this type of copyright infringement is hard to discover and they are at risk of unwittingly rewarding and then using a design that was in fact stolen. If the clients find out too late, the damages for them can be high. The terms of service of the platforms in this sector always clearly state that it is the designer who is liable, but for a defrauded client it can be difficult to exercise that right if the fraudster is based abroad.

The problem of plagiarism frequently also leads to conflicts among the participating designers. Those who try to contribute original ideas often report stolen ideas to the client – thus, also the policing of copyright infringements is effectively outsourced to the crowd. In general, it can be said that the extreme competition between the individuals in the creative crowd can cause a toxic work climate. All this contributes to the fact that the creative crowdworkers are comparatively unhappy with the working conditions and often feel unfairly treated or even exploited (see Leimeister et al. 2016).

When analysing and evaluating specific platforms for creative crowd work, one has to look closely at the extent to which the platform provider is moderating the design process in relation to how high the fee for its role as intermediary is. 99designs, for example, takes a fee of 35 to 50 per cent of the client's money, without making this transparent to either the client or the designer.⁸ On average, 99designs takes a commission of 40 per cent, which is very high, not only in comparison with freelance marketplaces, which only charge about half as much. 99designs does not contribute to the design process and, according to its terms of service, is not liable for any outcome whatsoever. The terms also state that when a designer finds a new client through a contest, all future communication with that client and especially all future commissions have to run through the platform, which will continue to charge a fee on all ensuing transactions. The only way out for the designer is to pay an "opt-out-fee" of US\$2,500 to the platform.⁹ This example shows how platforms instrumentalise the structural power asymmetry to take advantage of the crowdworkers. The latter have a chance of 1 in 100 to "win" a payment of 250 euros for work that they have custom-made in advance for the client. They carry all the legal risks and on top of that have to accept an opt-out fee that is about a thousand times higher than the average

exchange value for the design that they upload. The opportunities and risks on the largest platform for contest-based creative crowdwork are very unevenly distributed, and 99designs is not an exception.

There are, however, a few smaller platforms for contest-based creative work that are less unfair, paying out much higher sums and involving the crowd in the decision about who wins the contest. Most exemplary here is the Berlin-based platform Jovoto, which has about 80,000 registered designers working on marketing campaigns and new products, often for big brands and international corporations (see: Schmidt 2015; Al-Ani 2015). But even platforms explicitly dedicated to fairness cannot solve the fundamental problem of the creativity contests: the extraordinary amount of redundant unpaid labour.

In contrast to platforms such as 99designs, Jovoto's employees have a lot of design expertise and are very much involved in consultations with the clients and in the guidance of the crowd and the design process. By orchestrating the production process, they provide a better service to both sides and contribute a lot more to the creation of good solutions. However, by doing that much more, they also make the problematic model of contest-based labour accessible to high-profile clients with complex, high-value design projects. A higher percentage of formerly well-paid design jobs can therefore be transformed into precarious crowd work. In other words, while 99designs disrupts the lower strata of the design business, offering a discount solution to jobs that were already done by relatively badly paid independent contractors, Jovoto is disrupting a higher segment of the market, by enabling corporations such as Coca Cola, Deutsche Bank or Beiersdorf to make use of contest-based creative crowd work. On Jovoto, the crowdworkers have a much better status than on 99designs, but they are still in a significantly more precarious work situation than designers working in conventional agencies and for whom getting paid is not a lottery.

3.2 GIG WORK (LOCATION-BASED DIGITAL LABOUR)

Platforms for location-based digital labour have become possible only through the widespread dissemination of smartphones with GPS trackers. They are the prerequisite to orchestrate work that is not done somewhere "in the cloud" but on the go and at specific locations in the city. These relatively new gig work platforms are typically backed by much higher sums of venture capital than the cloud work platforms and their impact is more visible and potentially larger, especially in the gig work subcategories of accommodation and transportation, which involve a lot of capital and affect many jobs. At the same time, regulatory measures can be put into action much faster and more effectively than in cloud work, because for gig work this is typically done at the political level of individual cities.

With the exception of location-based microtasking, which due to its size is negligible (see Figure 2), gig work is always bound to a specific person who has to show up on time to do the job. The smartphones play an important role, not only for allocating jobs and people in space, but also for choosing

⁸ While the crowd work platform 99designs actively obfuscates the commission it takes, the gig work platform Helpling openly lists its fees in its terms of service. The degree of transparency differs greatly from one platform to the next.

⁹ See: 99designs terms of use, section 4, "Exclusivity and Non-Circumvention" (as of November 2016): <https://en.99designs.de/legal/terms-of-use>

a particular independent contractor or client, respectively, based on a profile with a real name and a set of ratings and reviews derived from previous transactions. Compared with cloud work, gig work demands more commitment from the workers. The platforms are more personal, people know much better who they are dealing with and they meet each other in person. The qualities of good service personnel, such as friendliness, punctuality, cultivated behaviour, well groomed appearance and so on influence how users rate each other. Even if the client does not really care who exactly is doing the job, it is always one individual who is responsible for delivering the expected results. Because gig work takes place in the physical world, there are a lot more personal risks involved than in cloud work, where occupational accidents, traffic accidents, theft and damage to property are of no real concern (Rohrbeck 2016). In order to counter these increased risks and ensure trust between users, the identity of gig workers is checked more thoroughly in advance by the platforms, for example by demanding a criminal record certificate. The importance of five-star ratings and favourable mutual reviews is more pronounced and the tracking of users by the platform providers is extended into physical space. The high degree of surveillance serves the safety of the users, but it also creates a treasure trove of very personal data. What that means was vividly illustrated when in 2012 the transportation app Uber analysed the movement profiles of its clients to estimate how many of them were probably having an affair. Uber called the late-night taxi rides in question "Rides of Glory" and published statistics for different North American cities. However, when this sparked outrage the company quickly withdrew this telling insight into its big data capacities.¹⁰

3.2.1 ACCOMMODATION

Airbnb, founded in 2008 and based in Silicon Valley, is the best-known platform for the listing of accommodation by private individuals, and with about two million listed properties in 34,000 cities all over the world, it is also the largest. Two of its biggest competitors, Wimdu and 9Flats, merged in October 2016 and are now based in Berlin – together they list about half a million flats. The trend towards short-term renting of private flats instead of booking hotels is a global, as well as a very urban phenomenon. Most listings are in cities and neighbourhoods popular with tourists. According to how Airbnb portrays itself, the service primarily revolves around organising short-term, intermediate lodging in spare rooms or in entire flats, while the owners, who usually live there, are away. Airbnb emphasises the private, non-commercial atmosphere of other people's homes, which is reflected in the company's name, a portmanteau of "air mattress" and "bed and breakfast". But over the years, a professional market has emerged, in which commercial hosts hold several flats especially for the purpose of renting them out via Airbnb.

This development is the most criticised aspect of Airbnb and similar platforms. The concern is that they take away

living space that cities need for regular long-term renting, and that they avoid paying taxes for commercial short-term accommodation. It is disputed how large the percentage of professional hosts on Airbnb actually is in total. Data journalism projects counter the official data published by the company with their own statistics. In the United States, this work is done by the project Inside Airbnb (by Murray Cox), and in Germany the website Airbnb vs. Berlin (by Studio Karat) offers similar insights. The German project was able to show that in 2015, the ten most active Airbnb hosts in Berlin together offered 281 flats. One individual even had 44 properties listed. Altogether, Airbnb lists about 12,000 flats per day in Berlin alone, which is 0.4 per cent of all the flats in the city. Ten per cent of these flats were provided by hosts with several properties. However, Airbnb tries to downplay this aspect. In Berlin and New York, where the platform is very popular, the authorities came to the conclusion that the commercial hosting of multiple flats is unlawful. New York Attorney General Eric T. Schneiderman estimated in an official report that about two-thirds of the New York listings in 2014 were illegal (Schneiderman 2014). The report put political pressure on Airbnb to release the actual data and in December 2015 the platform complied, although it only released the listings of one specific day. Murray Cox of Inside Airbnb and the sharing economy critic Tom Slee were able to prove, however, that the company had purged its platform from illegal listings shortly before the data snapshot. By doing so, Airbnb decreased the problematic listings from 18.6 per cent to 10.3 per cent (Cox/Slee 2016). The removal of hosts offering multiple flats happened only in New York and only for this one occasion. Since then, the listings have slowly returned to the original situation. This leaves little reason to believe that the company had a real interest in reversing the trend towards more commercial hosts. Airbnb later even admitted that it had purged its New York data, and that 38 per cent of its revenues in that city stem from a relatively small group of hosts holding multiple flats with the sole purpose of renting them out via Airbnb (Newcomer 2016).

In Berlin, the situation is similar. In May 2016 the transition period of a new law (passed in 2014) ended, which prohibits the misuse of flats for short-term rentals. Now, hosts need a special licence from the district authority if they want to professionally offer tourist accommodation. Infringements of this law can be punished with a fine of up to 100,000 euros. According to investigations by the German newspaper Die Zeit (in cooperation with Airbnb vs. Berlin), the company temporarily deleted commercial hosts in Berlin, too: the number of entire flats listed for rent dropped from 11,000 in February 2016 to 6,700 in March 2016; the number of listings by commercial hosts with multiple flats even dropped by 50 per cent down to 1,000 flats (Die Zeit 2016).

The two examples of New York and Berlin show a number of important aspects: the location-based services of the platform economy have a stronger, more immediate but also more visible local impact on cities than cloud work or crowd work. At the same time, local politicians can regulate the platforms much more effectively at this regional level. The ideal of the platform providers, to have one universal terms of service document that simply overrules or ignores the local jurisdictions, is met with strong opposition. This forces plat-

¹⁰ See: <http://www.nytimes.com/2014/12/08/opinion/we-cant-trust-uber.html>; Uber withdrew the original post but it is archived here: <https://web.archive.org/web/20140828024924/http://blog.uber.com/ridesofglory>.

forms such as Airbnb to adapt their service to political pressure at least locally. At the same time, it also becomes clear that regulators cannot blindly trust the data provided by the platforms, and that independent data journalism projects serve as an important corrective. The two examples also show that platforms actually do change their policy if they are legally obliged to. In the particular case of Airbnb, it was certainly helpful that the platform projects an image of itself as being the hub for private hosts who are primarily interested in sharing underused resources without making a business out of it, which is exactly what the legal framework in New York and Berlin allows for. Even though the platform makes a substantial part of its revenue from commercial, professional hosts, it cannot openly fight for this without damaging its homely sharing economy image.

3.2.2 TRANSPORTATION AND DELIVERY SERVICES

Transportation

The public perception of platform-based taxi services is very much informed by Uber. The company was founded in 2009 and reached a valuation of US\$62.5 billion in 2016. The name "Uber" has become shorthand for the disruptive power of the platform company, for advocates as well as for critics. New apps and services for gig work are commonly described or advertised with the formula "the Uber for XYZ" and "uberisation" is now a word for transforming an old business model accordingly. Its immediate competitor Lyft was founded in 2012 and reached a valuation of US\$5.5 billion in 2016. In 2015, General Motors (who also holds shares in Lyft) bought Uber's other competitor, Sidecar, and transformed the company into a delivery service for food (now discontinued). And the Norwegian company Haxi is pushing into the European market for private hire vehicles.

Seen from the passengers' perspective, Uber offers a service superior to that of conventional taxicabs. With just a touch on the smartphone, they can summon a car, see who their driver will be and where they are at the moment. They can see a representation of the car approach in real-time on their screen and they can give the driver a call to coordinate details. In comparison with regular cabs, the passengers perceive the service as more personal, friendly, reliable and also as cheaper. No cash is needed for the transaction and the passengers also feel safer because they know that Uber is tracking all rides via GPS. That way, parents can have an Uber-driver pick up their kids from school and always see exactly where they are.

Also from the drivers' perspective, Uber was seen as a blessing, at least at the beginning. As with all other forms of digital labour, people enjoy the flexibility and autonomy to work whenever and how much they like. It is the prime motivation for drivers to sign up with Uber and Lyft (in the United States, many drivers use both platforms in parallel). Originally, Uber was a service for luxury limousines with professional drivers, regularly licensed and insured (UberBLACK). However, propelled by the competition with Lyft, the service evolved into a platform that enabled anybody with a driving license and a private car to become a freelance chauffeur. After 2012,

Uber launched a succession of new products (UberX, UberGO, UberPOP, UberPOOL), which the company called "ride-sharing services" instead of taxicabs or limos, in order to evade legal regulations for professional transportation services. Uber promised its drivers that they can make US\$40 per hour, significantly more than minimum wage, and according to various interviews with Uber drivers, this was also realistic, at least for a while. The part-time drivers were happy with the additional income, invested in their cars and became full-time drivers. For many people who had lost their job after the financial crash of 2008, driving for Uber seemed to offer a new start. But after the introduction of the "ride sharing" concept in 2012, the number of drivers grew exponentially to 160,000 (Hall/Kruger 2015). Since then, no official numbers have been published, but it is estimated that as of 2016 Uber has about 450,000 active drivers per month.

The satisfaction of the drivers has since declined, while public protests against Uber have increased (Lazzaro 2006). The reason for this is not only that there are now too many drivers, but also that Uber is using the mechanisms of the platform economy described above to shift more and more of the risks and costs of the business to the side of the independent contractors – partly by using discount pricing to keep the upper hand in its competition with Lyft. From the already comparatively low fares that passengers have to pay (up to 45 per cent less than for a regular taxi), Uber takes a fee of 25 per cent for each ride. After having paid the 25 per cent fee to Uber, drivers still have to pay for all other costs: the lease or credit for their car, repairs, petrol, taxes and insurance. And they also have to absorb the cost of driving around idly, in phases where there is less demand or too many drivers on the streets. Because of the many variables that influence the price for a ride – depending on when, where, with what kind of car and under what sub-brand of Uber the drivers offer their service – there is no simple answer to what they actually earn on average.

Uber also dynamically defines in real-time how much a ride costs, based on the traffic situation in particular parts of the city. If there is a lot of traffic, due to peak hour or some other local event, Uber defines this as "surge" and raises the price. The drivers can then see the affected area on their map and the factor by which the regular price is multiplied. On occasions such as New Year's Eve, during rainstorms or after popular local sport events or concerts, when many people want to get home at the same time, the price for a ride can be up to eight times higher than usual.

The most detailed calculations regarding average earnings on Uber available, as of 2016, are based on the data of over a million rides. According to these numbers, the average hourly wage, after deduction of all fees and maintenance costs, was US\$13.17 in Denver, US\$10.75 in Houston and only US\$8.77 in Detroit – far below the US\$40.00 Uber used to promise its drivers (O'Donnovan/Singer-Vine 2016). On average, these drivers already earned less than the local minimum wage, before, in January 2016, Uber introduced an additional price cut, arguing that this was necessary to absorb a decline in bookings due to bad winter weather.¹¹ Regular taxicab

¹¹ See: <https://newsroom.uber.com/beating-the-winter-slump-price-cuts-for-riders-and-guaranteed-earnings-for-drivers/>.

drivers do not necessarily earn more, but they also do not carry that much risk. The investments of the independent contractors in a car of their own (and one of a certain standard, defined by Uber), can hardly be paid back when the average income through ride-sharing drops below minimum wage.¹²

Nevertheless, a new sub-prime credit market is emerging here, not unlike that of the 2008 housing bubble. Uber struck a deal worth over US\$1 billion with investment bank Goldman Sachs to be able to lend money – via Uber's subsidiary Xchange Leasing – to drivers whose credit score is too low for normal credit (Smith 2016). But if poor drivers have to go into debt to keep up on the platform, it becomes clear that Uber's claim to be just a ride-sharing service in the sharing economy is false. Also the promised flexibility in the working hours is untenable under these conditions. Those who go into debt to pay for a car cannot afford to be picky about when and where to drive, they need a maximum occupancy rate.

In addition to that, drivers also carry the financial risk of having car accidents, because, at least in the United States, most independent contractors of Uber and Lyft only have insurance for the private use of their cars. Which is why in case of an accident, they have to hide from their insurance company that they were using their vehicle for commercial rides.

Even though Uber used to officially refer to its drivers as "partners", it is obvious that they are not treated as equals. They have to negotiate from a position of weakness and are the only factor left in Uber's calculation where the company can cut costs to gain a financial advantage over its competitors. And according to Travis Kalanick, CEO of Uber, the workers are to be replaced as soon as possible by self-driving cars anyway. Together with Lyft and Google, Uber is part of the "Self-Driving Coalition", a lobbying group for autonomous vehicles, and is already testing the technology in a research and development project based in Pittsburgh (Crook 2016).

Across the world, Uber is involved in hundreds of lawsuits, and its services have become illegal in many cities and even entire countries – for example in Spain, France, Belgium, the Netherlands, Hungary and Germany.¹³ In a lot of these cases, legal bans were the result of massive protests by local cab drivers, and often Uber tried to simply ignore the rulings. In France, this went so far that two top executives of Uber were taken into custody and had to pay fines of 20,000 and 30,000 euros, respectively. The company itself had to pay a fine of 800,000 euros plus court costs for the infringements (Scott 2016). In the United States the company is facing increasing resistance, too: its drivers are unionising and filing class action lawsuits for misclassification as independent contractors. In one of these lawsuits, filed by 380 drivers from California and Massachusetts, Uber reached a settlement by paying the drivers US\$100 million. Because of this litigation, the drivers continue to be classified as independent contractors (Isaac/Schreiber 2016). Shortly afterwards, however, Uber was able to get an investment of US\$3.5 billion from Saudi Arabia. With that kind of backing, Uber can shrug off

the financial punishments in Europe and the US litigation for now. Nevertheless, the class action lawsuits could evolve into a serious threat to the business model, not only for Uber but also for similar companies in the platform economy (Kessler 2015).

Delivery Services

To some extent, the digital labour platforms for transportation blend into those for delivering goods from supermarkets and meals from restaurants. With its services UberRUSH and UberEATS, the leading "ride sharing" company is also pushing into these markets. As of 2016, this area of the gig economy is very dynamic and a lot of new companies emerge only to disappear again because a competitor buys them. Parallel to North American gig work platforms for deliveries – such as Spoon Rocket, Yelp Eat24, DoorDash, Instacart and Postmates – also a number of German companies have sprung up. The market-listed German start-up incubator Rocket Internet has invested a lot of venture capital in competing delivery services. The Berlin-based companies Hello Fresh (delivers via UPS, so it is not gig work) and Delivery Hero belong to the German start-up "unicorns", with valuations of US\$2.9 billion and US\$3.1 billion, respectively. Other competitors are MyLorry, Pizza.de, Foodpanda, Lieferando (which is one of eleven subsidiaries of the Dutch company Takeaway.com), Deliveroo and Foodora (which is a subsidiary of Delivery Hero). There are more, but a comprehensive list is beyond the scope of this study and as yet there is little reliable data for most of these companies. Therefore, only the basic principles are described in what follows, based on the example of Deliveroo.

An investment banker founded the platform for restaurant deliveries in 2013 in London. As of August 2016, the company had raised a total of US\$473 million in venture capital and reached a valuation of about US\$1 billion; the service is available in 84 cities across twelve countries and 20,000 self-employed cyclists deliver food from more than 16,000 restaurants; from November 2015 to August 2016 the company grew by 400 per cent (Fegor/Murgia 2016). As in all other areas of the platform economy, Deliveroo mediates between supply and demand. It allows restaurants that previously had no such service to have their food delivered to their customers. For this, Deliveroo charges a fee of 30 per cent from the restaurants, which, despite the high fees, hope to make more profit due to the increased outreach. Trade organisations in this sector, such as the German Hotel and Catering Association, are concerned about the emergence of monopolies. It is feared that customer loyalty will no longer be with the restaurant but with the delivery platform, which will, in the medium term, be able to dictate the conditions and margins, as already happened with Uber (Zacharakis 2016).

Contrary to the work conditions at Uber, the independent contractors working for Deliveroo have fixed three-hour shifts, in which they have to be available on demand in a certain district. In the United Kingdom, Deliveroo pays them £7 per hour plus £1 for each delivery; in Germany it is 7.50 euros, plus 1 euro per delivery. The delivery is typically done by bike, which means that the high initial investment of buying or leasing a car, as well as the costs for fuel are not a problem

¹² See: www.NotCoolUber.com.

¹³ Wikipedia has a comprehensive list of Uber's legal status across the world: https://en.wikipedia.org/wiki/Legal_status_of_Uber's_service.

here and the maintenance costs are much less of an issue. However, the risk of getting hurt in an accident is comparatively high, given that the cyclists spend most of their working hours in traffic. It is the independent contractors' responsibility to have health insurance, accident insurance and third-party liability insurance. However, according to an interview with a deliverer from Berlin, many of them cut these costs at least partially and cycle at their own risk (Lehmann 2016).

Competitor Homejoy.com had to deal with four such lawsuits, which deterred investors and ultimately led to the closure of the platform in 2015 (Deamicis 2015).

3.2.3 HOUSEHOLD SERVICES AND PERSONAL SERVICES

The final category of the gig economy, again described here only briefly, involves services that are provided by independent contractors in the homes of their clients. Because they are set in private environments, the factors of trust, quality and continuity (the same person showing up to do the job) play a much greater role than is the case with delivery services. Again, there are as yet no academic studies about this area of gig work, only newspaper reports and interviews with platform providers and independent contractors. It is quite possible that this category will have to be further subdivided in the future. Currently, the most well-known platforms in this area, at least in Germany, primarily provide cleaning services; examples are Helping and Book A Tiger, both founded in 2014. American platforms such as TaskRabbit (founded in 2008) and Handy.com (founded in 2012) also offer errands, repairs, Ikea furniture assembly and the like – they are generalists, promising to free busy customers from all possible household chores. For all these household services, the client's level of trust towards the gig workers must be high enough to give them unsupervised access to their private home and the two parties do not necessarily have to spend time together.

However, there are also personal services such as home care and nursing, babysitting and, last but not least, prostitution (Kauf-mich.com, 2009; Olalah.com, 2015), which are about human exchange, time spent together, and which are now mediated by platform-based business models as well. For this development, however, it is still early days.

There are two important and interconnected limiting factors for the success of platform-based household services and personal services: people who have to do cleaning jobs as self-employed and exchangeable gig workers are (or are at least perceived to be) less reliable and deliver inferior quality, if left unsupervised, than clients and platform providers expect. The platforms therefore try to monitor and control the way the work is done – the personal appearance of the gig workers, their clothes, their schedule. All of this makes the platforms for cleaning services particularly vulnerable to getting sued for misclassification of the workers. Both the legal pressure and the striving for quality assurance have already led several platforms in this sector, in Germany as well as in the United States, to switch back to conventional employment or at least to pay and train the workers better, and generally invest in a more reliable, stable staff. In 2014, Handy.com was sued for misclassification of employees as independent contractors. As so often, the legal case was referred to a court of arbitration, but the class action law suits remain a threat to the business (see: Seiner 2016; Said 2014).

4

OUTLOOK

The future of work will be shaped by a number of technology-driven developments: automation, platform-based outsourcing of services to self-employed individuals, the division of formerly secure jobs into ever smaller and precarious tasks, and the constant big-data tracking of the work process. These trends are not happening in isolation, but are mutually dependent.

Automation threatens to destroy jobs, for example by replacing professional drivers with self-driving cars, and by introducing robots that can work hand in hand with humans on the assembly line; but it also creates numerous new jobs (arguably sometimes of lower quality), for example in the micro-tasking sector, where humans continue to be needed for the creation of reliable data sets that form the basis for automation. An often-cited study by researchers from Oxford University analysed the likelihood of specific jobs being automated (Frey/Osborn 2013). It is advisable to use a similar approach to assess the likelihood of specific occupational fields to be disrupted by or transformed into cloud work, crowd work or gig work. Over the past ten years, we have seen a rapid growth of these new forms of labour, but there is a lot of disagreement among experts about whether this development will continue to accelerate or reach a plateau soon. As with automation, the change is not yet happening across the board; only some areas are particularly prone to it. It is important to look closely at these emerging digital labour markets, from the perspective of both research and politics, to become familiar with their mechanics and develop ways to fix them, where necessary.

As of 2016, the new forms of digital labour only affect a small percentage of the labour market and only rarely take the function of a full-time job. Not every job can be outsourced to the crowd. But the basic principles of the platform economy do indeed have the potential to fundamentally disrupt the way work is distributed in society.

The already successfully implemented regulatory initiatives in the area of gig work show, however, that governments can actively influence the development, at least of the location-based digital labour markets for gig work, and that a deterministic attitude towards technology-driven disruption is out of place. At the same time, it is important not to pre-

vent beneficial and necessary innovation in the service sector out of fear of change. Established organisational forms and business models must not automatically fall under government protection and a modern society also needs unregulated spaces to test and develop innovative concepts, for example to organise supply and demand or the division of labour more efficiently. However, when a technology or service leaves the sandbox stage and becomes so widespread that it affects the lives of millions of people, the government must put the interests of society before the business interests of individual entrepreneurs. Regulation is necessary to protect social security, workers' rights and consumer rights also in the digital realm. There is no reason why hard-won labour laws should not apply, merely because the work is organised via a platform.

The platform model offers many advantages over conventional forms of organisation, but it is necessary to distribute the entrepreneurial opportunities and risks, as well as the social costs, more fairly. Without regulation, it has become clear over recent years that mainly the platform providers and to some extent their clients benefit from the new opportunities, while they shift the entrepreneurial risks to the contractors and leave the social costs, such as threatening old-age poverty, to society.

The question therefore is: how can the development of digital labour platforms be influenced positively in terms of fair and socially acceptable working conditions? First, it needs more research, a consistent categorisation and taxonomy of the different platform-based outsourcing mechanisms and more robust data on their usage. The platforms already have this data, but often treat it as a business secret. It is still unclear, for example, which digital labour platforms are already profitable and which ones so far are still only burning the venture capital of their investors. Reliable data is also important to differentiate active workers from those who have only registered once and never put in any hours, to calculate average hourly wages and to find out how many people have turned cloud work or gig work into a full-time job (according to all estimates, only a small minority). The existing studies are mostly based on interviews with individual crowd workers and gig workers; in addition, more quantitative studies

are needed, as well as data journalistic watchdog projects (similar to Inside Airbnb and Airbnb vs. Berlin) to counter the official and often misleadingly selective data published by the platforms.

In general, there is a need for more transparency regarding the processes on the platforms, the terms of service agreements, the mediation fees incurred and the liability rules. The terms of service agreements should be presented in a form that allows users to make informed decisions about the conditions under which they want to work. The platform companies have outstanding capabilities in the field of user-friendly interface design. They should be obliged to use these skills to create navigable surfaces for the terms of service agreements, with more options than just an all-encompassing "agree" button.

Perhaps it will also require independent, trustworthy digital labour organisations, similar to consumer advocate institutions, to test and evaluate the working conditions on the various digital labour platforms, and warn workers, independent contractors and clients of particularly problematic clauses in the terms of service agreements. The watchdog project Fair-CrowdWork.org organised by Germany's largest trade union, IG Metall, is already a step in this direction. On this site, trade union legal experts offer assessments and warnings regarding the terms of service agreements of numerous digital labour platforms. However, given that there are hundreds of relevant (and thousands of marginal) digital labour platforms, with constantly changing terms of service and jurisdictions spread across the world, it is hardly possible to keep up with the workload of this legal evaluation in real-time.

The evaluation of working conditions on digital labour platforms is easier, at least in principle, because the workers themselves can do this; in other words, it can be crowd-sourced. This is also a feature of FairCrowdWork.org, inspired by the tool Turkopticon. Developed by Lilly Irani and Six Silberman, Turkopticon is a successful approach to reverse the information asymmetry on Amazon Mechanical Turk and give the crowdworkers the opportunity to evaluate their clients – not just the other way around (Irani and Silberman 2013 & 2014). Turkopticon is a tailor-made external add-on, a very useful hack, to make one particular platform a bit fairer. For a meta-evaluation website such as FairCrowdWork.org, however, the challenge is to find enough workers from across many different platforms to obtain meaningful and reliable assessments.

Cross-platform mobilisation and organisation of crowdworkers turns out to be difficult. It seems that many crowdworkers, even if they are dissatisfied with the working conditions or the remuneration on a specific platform, have little interest in either self-organisation or representation of their interests by trade unions. Plans for potential regulation of digital labour platforms by the state are typically met with great scepticism. For the majority of the crowd, work on the platforms is temporary and sporadic anyway, a small side-job, not worth fighting for. For them it is much easier and more promising to simply search for a new platform with better working conditions. Professional full-time crowdworkers, on the other hand, fear that regulation of the platforms would not improve their jobs, but destroy them. Although there are forms of self-organisation by crowdworkers and gig workers

in various platform-specific forums, they usually revolve around how to get the best out of the difficult working conditions individually; they are less about workers' participation, collective bargaining and improvement of the digital labour model in general. A crowd, in the physical world as well as online, can potentially bundle the forces of all participants. The group is then stronger than the sum of its parts. The individuals in the working crowd, however, are typically in total competition with each other, thereby weakening each other instead of acting together and improving their joint negotiating power with the clients and, more importantly, the platform providers.

Having said that, over the past two years, a new movement has been taking shape under the name "Platform Cooperativism", which is not trying to negotiate with platform owners but aspires to run its own platforms. Initiated and promoted by German-born digital labour expert and activist Trebor Scholz, professor at the New School in New York, the movement advocates a new platform type based on cooperative ownership (Scholz 2014, 2016). With the revival of this old approach and its application to new forms of labour, the crowd workers and gig workers can regain control over their working conditions. By building and owning the platforms themselves, they can design working conditions from the bottom up, which are continuously determined by workers' participation instead of investors' expectations of exponential growth and profit or economic-rent maximisation. It is highly questionable whether comparatively small and local coop-platforms can compete economically with exploitative competitors operating on a global scale. However, as with "organic" and "fair trade" labels, the activists could foster a willingness in their clients to consciously pay a little more for a service that is guaranteed to have substantially better, more ethical, production conditions.

Also outside the cooperative model, on conventional digital labour platforms, it would be important for the clients to have more reliable information about the working conditions. Not only positive fair trade labels, but also warnings, similar to those on advertising for alcohol or gambling, could be useful to give larger companies an incentive to stay away from exploitative platforms as part of their corporate social responsibility efforts. In the same vein, efforts at self-regulation by the platforms should be supported. In 2015, the German crowd work platform Testbirds published a "Code of Conduct – a guideline for a prosperous and fair cooperation between companies, clients and crowdworkers".¹⁴ The document, signed also by the management of the platforms Clickworker and Streetspotr, addresses a lot of the grievances often brought forward by crowd workers and takes a stand for fair payment and open and transparent communication between the different stakeholders. If nothing else, the document proves that there is also a willingness on the side of the platform owners to counter the negative image of the industry and to improve conditions. Such advances can have an important signalling effect, at least for certain market segments, to reverse the downside spiral in terms of quality and price.

¹⁴ See: <http://www.crowdsourcing-code.com/>.

At the same time, it must be remembered that, within the spectrum of different platform types outlined in this discussion paper, it is the crowd workers in particular who will, in all likelihood, be subjected to wage dumping, at least to a large extent, simply because individuals are interchangeable in the crowd. In an open crowd that is recruited from a global pool of workers without pre-selection based on qualifications, it is not possible to secure adequate pay for each individual, because a potentially high proportion of unqualified and unmotivated workers must be absorbed in the overall balance – either by paying only small amounts to everybody, or by paying only the very best contributors properly, leaving all others empty handed. The demand for a minimum wage for global cloud work also faces the problem of what particular countries take as a benchmark for fair pay, when workers and clients can come from anywhere. As we have seen before in earlier phases of outsourcing, certain jobs will inevitably be shifted to developing countries still with a low cost of living, but relatively high levels of education and good knowledge of English. Countries such as India, Indonesia and the Philippines already play an important role here.

Regulatory efforts have significantly better prospects in the area of gig work. On one hand, because clients and contractors are subject to the same local jurisdiction, on the other hand, because claims for misclassification of employees as independent contractors are particularly valid in this area of the platform economy. In addition, gig work often disrupts service sectors that are already well organised when it comes to minimum wage and worker protection (in contrast to data processing and design jobs common in crowd work). For household services, be it cleaning or repair work, there is also the argument that governments could potentially benefit from the transformation towards platform-based business models, because this now makes visible and taxable areas of the economy in which clandestine employment has traditionally been endemic.

In the household services sector, one phenomenon is becoming particularly clear, which ultimately applies to all forms of digital labour: when the quality of the results and the trust between client and customer become more important than a low price, the platform model quickly reaches its limits. In those cases, it pays to invest in individual workers, train them and bind them to the employer with fair working conditions and real career prospects. This also makes it highly unlikely that the entire labour market will eventually dissolve into micro-tasking. Nonetheless, ten years after the emergence of the first crowd work platforms, it can be said with some certainty that this is not just a temporary phenomenon. A new low-wage sector for digitally mediated labour has been established and it will continue to exist and grow.

It is the job of governments to ensure the continuity of the social security systems in order to be able to take care of those who are no longer able to do so themselves. The great challenge therefore is to generate social security contributions even from microtasks, to oblige platform providers and clients, as the two parties that benefit the most from the contingent on-demand workforce, to at least partly carry the social costs or oblige them to pay so much that the independent contractors can themselves cover the costs for things like health insurance, and are also obliged to do so.

In addition, it must be ensured that people are not involuntarily pushed into these precarious new working conditions, for example because conventional companies that do pay for social security, safety and training of their workers can no longer compete with the cheaper platform-based companies that have found a way to route around any social costs of labour. Disruption must not be an end in itself. The new structures must be measured against their social compatibility and, if necessary, regulated by law in order not to harm the public good in the long run.

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Bibliography

- Ahn, Luis von 2005: Human Computation, Pittsburgh.
- Al-Ani, Ayad; Stumpp, Stefan 2015: Motivationen und Durchsetzung von Interessen auf kommerziellen Plattformen: Ergebnisse einer Umfrage unter Kreativ- und IT-Crowdworkern, HIIG Discussion Paper Series 2015 (5), <http://www.ayad-al-ani.com/pdf/SSRN-id2699065.pdf> (13.8.2016).
- Al-Ani, Ayad; Stumpp, Stefan; Schildhauer, Thomas 2014: Crowd-Studie 2014: Die Crowd als Partner der deutschen Wirtschaft, HIIG Discussion Paper Series 2014 (2), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2437007 (13.8.2016).
- Aneesh, Aneesh 2009: Global Labor: Algocratic Modes of Organization, in *Sociological Theory* 27 (4), Milwaukee.
- Araujo, Ricardo M. 2013: 99designs: An Analysis of Creative Competition in Crowdsourced Design, in: First AAAI Conference on Human Computation and Crowdsourcing.
- Asher-Schapiro, Avi 2014: Against Sharing, in: *Jacobin Mag*, 19.9.2014, <https://www.jacobinmag.com/2014/09/against-sharing/> (13.8.2016).
- Balestier, Courtney 2016: The Supermarket Must Die: App-Fueled Services Can Kill It, in *Wired*, 14.4.16.
- Benner, Christiane 2015: Crowdwork – zurück in die Zukunft?: Perspektiven digitaler Arbeit, Frankfurt am Main.
- Botsman, Rachel 2012: Welcome to the New Reputation Economy, in: *Wired UK*, 20.8.2012, <http://www.wired.co.uk/article/welcome-to-the-new-reputation-economy> (13.8.2016).
- Brabham, Daren C. 2013: *Crowdsourcing*, MIT Press, Cambridge.
- Brabham, Daren C. 2012: The Myth of Amateur Crowds, in: *Information, Communication & Society* 15 (3), pp. 394–410.
- Chen, Adrian 2014: The Laborers Who Keep Dick Pics and Beheadings Out of Your Facebook Feed, in: *Wired*, 23.10.14.
- Chen, Michelle 2015: Uber Wins a Battle With New York, Now It's War, in: *The Nation*, 24.7.2015, <https://www.thenation.com/article/uber-wins-battle-with-new-york-now-its-war/> (13.8.2016).
- Cherry, Miriam A. 2012: The Gamification of Work, in: *Hofstra Law Review* 40 (4), Hempstead, New York.
- Cherry, Miriam A. 2016: Beyond Misclassification: The Digital Transformation of Work, in: *Comparative Labor Law & Policy Journal*, Champaign.
- Coldwell, Will 2016: Airbnb: From Homesharing Cool to Commercial Giant, in: *The Guardian*, 18.3.2016.
- Cox, Murray; Slee, Tom 2016: How Airbnb's Data Hid the Facts in New York City, Report vom 10.2.2016, <http://whimsley.s3.amazonaws.com/wordpress/wp-content/uploads/2016/02/how-airbnbs-data-hid-the-facts-in-new-york-city.pdf> (13.8.2016).
- Crook, Jordan: Uber Confirms it's Testing Self-driving Cars in Pittsburgh, 19.5.2016, <http://techcrunch.com/2016/05/19/uber-confirms-its-testing-self-driving-cars-in-pittsburgh/> (13.8.2016).
- Däubler, Wolfgang 2015: Crowdworker – Schutz auch außerhalb des Arbeitsrechts?, in: Benner, Christiane (Hrsg.): *Crowdwork – zurück in die Zukunft?*, Frankfurt am Main.
- Danaher, John 2016: The Threat of Algocracy: Reality, Resistance and Accommodation, in: *Philosophy & Technology* 2016, pp. 1–24.
- Davidson, Adam 2016: Managed by Q's „Good Jobs“ Gamble, in: *The New York Times*, 25.2.2016.
- Dayen, David 2016: Uber Spends \$100 Million to Save its Business Model, But It May Have Just Doomed It, in: *Alternet*, 27.4.2014.
- Deamicis, Carmel 2015: Homejoy Shuts Down After Battling Worker Classification Lawsuits, in: *Recode*, 17.7.2015, www.recode.net/2015/7/17/11614814/cleaning-services-startup-homejoy-shuts-down-after-battling-worker (13.8.2016).
- Deutschkron, Shoshana 2013: The Rise of Specialists Online: Growing Opportunity for a Long Tail of Skills, *Upwork Blog*, <https://www.upwork.com/blog/2013/08/1billion-odeskskillslongtail/> (31.5.2016).
- Die Zeit 2015: Frankreich: Uber-Manager in Paris festgenommen, 29.7.2015, <http://www.zeit.de/mobilitaet/2015-06/uberpop-frankreich-festnahme-fahrdienst-protest> (13.8.2016).

- Die Zeit 2016: Ferienwohnungen: Airbnb kündigt Vermietern in Berlin, 27.4.2016, <http://www.zeit.de/wirtschaft/unternehmen/2016-04/airbnb-berlin-ferienwohnungen-vermieten-zweckentfremdung-gesetz> (13.8.2016).
- Dzieza, Josh 2015: The Rating Game: How Uber and its Peers Turned us Into Horrible Bosses, in: *The Verge*, 28.10.15.
- European Agency for Safety and Health at Work 2015: A Review on the Future of Work: Online Labour Exchanges or „Crowdsourcing“: Implications for Occupational Safety and Health, <https://osha.europa.eu/de/tools-and-publications/publications/future-work-crowdsourcing> (13.8.2016).
- Eyeka 2016: The State of Crowdsourcing in 2016, Paris.
- Fish, Adam; Srinivasan, Ramesh 2012: Digital Labor Is the New Killer App, in: *New Media & Society* 14 (1), pp. 137–152.
- Frey, Carl Benedikt; Osborne, Michael A. 2013: *The Future of Employment: How Susceptible Are Jobs to Computerisation*, Oxford.
- Giles, Jim 2011: Getting the Job Done, With a Silicon Boss, in: *New Scientist* 209 (2798), pp. 20–21.
- Gray, Mary L.; Ali, Syed Shoaib; Suri, Siddharth; Kulkarn, Deepti 2016: The Crowd is a Collaborative Network, in: *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing*, 134–147, CSCW '16, New York.
- Greenbaum, David 2014: Humans And Computers Will Come Together For Middle Work, in: *TechCrunch* 12.7.2014, <https://techcrunch.com/2014/07/12/humans-and-computers-will-come-together-for-middle-work/> (13.8.2016).
- Hack, Günter 2014: Internetkultur: Der Aufstieg des Datenproletariats, in: *Die Zeit*, 10.9.2014, <http://www.zeit.de/kultur/2014-09/daten-proletariat-internet> (13.8.2016).
- Hagi, Andrei; Wright, Julian 2015: Multi-Sided Platforms, in: *Harvard Business School*, 1.11.2015.
- Hall, Jonathan V.; Krueger, Alan B. 2015: *An Analysis of the Labor Market for Uber's Driver-Partners in the United States*, Princeton.
- Halzack, Sarah 2014: Elance-oDesk Flings Open the Doors to a Massive Digital Workforce, in: *The Washington Post* 13.6.2014, https://www.washingtonpost.com/business/freelancers-from-around-the-world-offer-software-developing-skills-remotely/2014/06/13/f5088c54-efe7-11e3-bf76-447a5df6411f_story.html (13.8.2016).
- Hamburger Institut für Sozialforschung 2015: *Von Maschinen und Menschen: Arbeit im digitalen Kapitalismus*, Bd. 36, Hamburg.
- Harman, Greg 2014: The Sharing Economy Is Not as Open as You Might Think, in: *The Guardian*, 12.11.14.
- Harris, Christopher G. 2011: Dirty Deeds Done Dirt Cheap: A Darker Side to Crowdsourcing, in: *IEEE Third International Conference on Social Computing (SocialCom'11)*.
- Hatton, Celia 2015: China „Social Credit“: Beijing Sets Up Huge System, 26.10.2015, <http://www.bbc.com/news/world-asia-china-34592186> (13.8.2016).
- Hodson, Hal 2013: Crowdsourcing Grows Up as Online Workers Unite, in: *New Scientist*, Feb. 2013.
- Holland, Martin 2016: PeepLe: App zum Bewerten von Menschen trotz heftiger Kritik verfügbar, 8.3.2016, <http://www.heise.de/newsticker/meldung/PeepLe-App-zum-Bewerten-von-Menschen-trotz-heftiger-Kritik-verfuegbar-3130254.html> (13.8.2016).
- Hunt, Elle 2016: PeepLe, the „Yelp for People“ Review App, Launches in North America on Monday, in: *The Guardian*, 7.3.2016.
- Huws, Ursula 2015: iCapitalism and the Cyberariat, in: *Monthly Review* 66 (8).
- Isaac, Mike; Scheiber, Noam 2016: Uber Settles Cases With Concessions, but Drivers Stay Freelancers, in: *New York Times*, 21.4.2016, <http://www.nytimes.com/2016/04/22/technology/uber-settles-cases-with-concessions-but-drivers-stay-freelancers.html> (13.8.2016).
- Irani, Lilly C. 2015: Justice for „Data Janitors“, in: *Public Books*, 15.1.2015, <http://www.publicbooks.org/nonfiction/justice-for-data-janitors> (13.8.2016).
- Irani, Lilly C.; Silberman, M. Six 2014: From Critical Design to Critical Infrastructure: Lessons from Turkopticon, in: *Interactions* 21 (4), pp. 32–35.
- Irani, Lilly C., Silberman, M. Six 2013: Turkopticon: Interrupting Worker Invisibility in Amazon Mechanical Turk, in: *Proceedings of the SIGCHI Conference*, pp. 611–620, CHI '13, New York.
- Kasperkevic, Jana 2016: Airbnb Purged More than 1.000 New York Listings to Rig Survey – Report, in: *The Guardian*, 10.2.2016.
- Kelty, Christopher M. 2008: *Two Bits: The Cultural Significance of Free Software*, Durham.
- Kenney, Martin 2014: Rethinking Labor (and Capital) in the Era of the Cloud, Vortrag auf dem BRIE-ETLA Annual Meeting, Helsinki, 29.8.2014.
- Kessler, Sarah 2014: Pixel And Dime: On (Not) Getting By In The Gig Economy, in: *Fast Company*, 18.3.2014.
- Kessler, Sarah 2015: The Domestic Workers Alliance Creates New Framework For Improving Gig Economy Jobs, in: *Fast Company*, 6.10.2015.
- Kessler, Sarah 2015: The Gig Economy Won't Last Because It's Being Sued to Death, in: *Fast Company*, 17.2.2015.
- Khaleeli, Homa 2016: The Truth About Working for Deliveroo, Uber and the On-demand Economy, in: *The Guardian*, 15.6.2016, <https://www.theguardian.com/money/2016/jun/15/he-truth-about-working-for-deliveroo-uber-and-the-on-demand-economy> (13.8.2016).
- Kingsley, Sara C.; Gray, Mary L.; Suri, Siddharth 2014: *Monopsony and the Crowd: Labor for Lemons?*, Microsoft Research, New York.
- Kittur, Aniket; Nickerson, Jeffrey V.; Bernstein, Michael S.; Gerber, Elizabeth M.; Shaw, Aaron; Zimmerman, John; Lease, Matthew; Horton, John J. 2013: *The Future of Crowd Work*, San Antonio, CSCW Conference Paper, San Antonio.
- Klebe, Thomas; Neugebauer, Julia 2014: Crowdsourcing für eine Handvoll Dollar, in: *Arbeit und Recht*, 2014 (1), 62. Jg., pp. 4–7.
- Knight, Sam 2016: How Uber Conquered London, in: *The Guardian*, 27.4.2016.
- Kosner, Anthony Wing 2015: Google Cabs and Uber Bots Will Challenge Jobs Below The API, in: *Forbes*, 4.2.2015.
- Kreider, Tim 2013: Slaves of the Internet, Unite!, in: *New York Times*, 26.10.2013.
- Lee, Min Kyung; Kusbit, Daniel; Metsky, Evan; Dabbish, Laura 2015: Working with Machines: The Impact of Algorithmic and Data-Driven Management on Human Workers, in: *Proceedings of the 33rd Annual ACM Conference*, pp. 1.603–1.612, CHI '15, New York.
- Lazzaro, Sage 2016: Uber Drivers Plan Boycott After Fare Cuts Slash Their Earnings to Below Minimum Wage, in: *Observer*, 19.1.2016, <http://observer.com/2016/01/uber-drivers-plan-boycott-after-fare-cuts-slash-their-earnings-to-below-minimum-wage/> (13.8.2016).
- Lehmann, Hendrik 2016: „Deliveroo kürzt uns einfach das Gehalt“, in: *Tagesspiegel*, 23.5.2016, <http://digitalpresent.tagesspiegel.de/deliveroo-kuerzt-uns-einfach-das-gehalt> (13.8.2016).
- Leimeister, Jan Marco et al. 2016: *Crowd Work im Netz*, Arbeitspapier der Hans-Böckler-Stiftung.
- Leimeister, Jan Marco; Zogaj, Shkodran; Durward, David 2015: New Forms of Employment and IT – Crowdsourcing, in: *4th Conference for the Regulating for Decent Work Network*, Genf.
- Leong, Nancy 2014: The Sharing Economy has a Race Problem, in: *Salon*, 2.11.2014.
- Lobo, Sascha 2014: Auf dem Weg in die Dumphöhle: Sharing Economy wie bei Uber ist Plattform-Kapitalismus, in: *Spiegel Online*, 3.9.2014.
- Martin, David; Hanrahan, Benjamin V.; O'Neill, Jacki; Gupta, Neha 2014: „Being a Turker“. In *Proceedings of the 17th ACM Conference on Computer Supported Cooperative Work & Social Computing*, pp. 224–235.
- Marvit, Moshe Z. 2014: How Crowdworkers Became the Ghosts in the Digital Machine, in: *The Nation*, 4.2.2014.
- Morozov, Evgeny 2016: The State Has Lost Control: Tech Firms Now Run Western Politics, in: *The Guardian*, 27.3.2016.
- Motoyama, Marti; McCo, Damon; Levchenko, Kirill; Savage, Stefan; Voelker, Geoffrey M. 2011: Dirty Jobs: The Role of Freelance Labor in Web Service Abuse, in: *Proceedings of the 20th USENIX Conference on Security*, 14–14. SEC'11. Berkeley, CA, USA: USENIX Association, 2011.
- Newcomer, Eric 2016: Airbnb Says It Removed 1,500 Listings in New York Before Data Release, in: *Bloomberg*, 25.2.2016, <http://www.bloomberg.com/news/articles/2016-02-25/airbnb-says-it-removed-1-500-listings-in-new-york-before-data-release> (13.8.2016).
- O'Donovan, Caroline; Singer-Vine, Jeremy 2016: How Much Uber Drivers Actually Make Per Hour, in: *BuzzFeed News*, 23.6.2016, <https://www.buzzfeed.com/carolineodonovan/internal-uber-driver-pay-numbers> (13.8.2016).
- OECD 2015: *OECD Employment Outlook 2015*, Paris.

- O'Hear, Steve 2016: Rocket Internet's Helping Mops Up Another \$45M For Its On-demand Home Cleaning Service, in: TechCrunch 25.3.2015.
- Papsdorf, Christian 2009: Wie Surfen zu Arbeit wird: Crowdsourcing im Web 2.0, Frankfurt/Main.
- Pasquale, Frank; Vaidhyanathan, Siva 2015: Uber and the Lawlessness of „Sharing Economy“ Corporates, in: The Guardian, 28.7.2015.
- Popper, Ben 2015: Airbnb's Worst Problems Are Confirmed by Its Own Data, in: The Verge, 4.12.2015.
- Ptak, Laurel 2013: Wages For Facebook, <http://wagesforfacebook.com/> (31.5.2016).
- Rogers, Brishen 2015: The Social Costs of Uber, in: The University of Chicago Law Review, https://lawreview.uchicago.edu/sites/lawreview.uchicago.edu/files/uploads/Dialogue/Rogers_Dialogue.pdf (13.8.2016).
- Rohrbeck, Felix 2016: „Meine Wohnung wurde zerstört“, in: Die Zeit, 21.1.2016, <http://www.zeit.de/2016/04/wimdu-berlin-apartments-vandalismus> (13.8.2016).
- Rutkin, Aviva 2014: Off the Clock, on the Record: Wearable Tech Lets Boss Track Your Work, Rest and Play, in: New Scientist, 20.10.2014.
- Salehi, Niloufar; Irani, Lilly C.; Bernstein, Michael S.; Alkhatib, Ali; Ogbe, Eva; Clickhappier, Kristy Milland 2015: We Are Dynamo: Overcoming Stalling and Friction in Collective Action for Crowd Workers, in: Association for Computing Machinery, Seoul 2015.
- Said, Carolyn 2014: Handy.com Housecleaners' Lawsuit Could Rock On-demand Companies, in: SFGate, 13.11.2014, <http://www.sfgate.com/business/article/Handy-com-housecleaners-lawsuit-could-rock-5891672.php> (13.8.2016).
- Schechner, Sam 2015: Two Uber Executives Indicted in France, in: Wall Street Journal, 30.6.2015.
- Schmidt, Florian Alexander 2013: The Good, the Bad and the Ugly: Why Crowdsourcing Needs Ethics, in: Third International Conference on Cloud and Green Computing (CGC), pp. 531–35, 2013.
- Schmidt, Florian Alexander 2015: The Design of Creative Crowdwork: From Tools for Empowerment to Platform Capitalism, London.
- Schneiderman, Eric T. 2014: Airbnb and the City, Report, Büro des New York State Attorney General, New York.
- Scholz, Trebor 2016: Platform Cooperativism: Challenging the Corporate Sharing Economy (dt. Wie wir uns die Sharing Economy zurückholen können), Rosa Luxemburg Foundation, New York.
- Scholz, Trebor 2015: Think Outside the Boss. Public Seminar, <http://www.publicseminar.org/2015/04/think-outside-the-boss/#.V6-W165rX-m> (13.8.2016).
- Scholz, Trebor 2014: Platform Cooperativism vs. the Sharing Economy, Medium, <https://medium.com/@trebors/platform-cooperativism-vs-the-sharing-economy-2ea737f1b5ad#.moyp7dbht> (13.8.2016).
- Scholz, Trebor 2013: Digital Labor: The Internet as Playground and Factory, New York.
- Scott, Mark 2016: Uber and Its Executives Are Fined in France, in: New York Times, 9.6.2016, <http://www.nytimes.com/2016/06/10/technology/uber-and-its-executives-fined-in-france.html> (13.8.2016).
- Seiner, Joseph A. 2017: Tailoring Class Actions to the On-demand Economy, 77 Ohio State Law Journal, (i. E.).
- Sharma, Dinesh C. 2014: Indiens IT-Industrie, 25.3.2014, <http://www.bpb.de/internationales/asien/indien/189895/indiens-it-industrie> (13.8.2016).
- Shead, Sam 2015: London Startup Deliveroo Has Raised \$100 Million for Its Restaurant Delivery Service, in: Business Insider Deutschland, 24.11.2015, <http://www.businessinsider.de/london-startup-deliveroo-has-raised-100-million-for-its-restaurant-delivery-service-2015-11> (13.8.2016).
- Shet, Vinay 2014: Street View and reCAPTCHA Technology Just Got Smarter, in: Google Online Security Blog, 16.4.2014.
- Singer, Natasha 2014: In the Sharing Economy, Workers Find Both Freedom and Uncertainty, in: The New York Times, 16.8.2014.
- Smith, Lindsey J. 2016: Wall Street Loans Uber \$1 Billion to Offer Subprime Auto Leases, in: The Verge, 3.6.2016, <http://www.theverge.com/2016/6/3/11852940/uber-subprime-auto-loans-drivers-xchange> (13.8.2016).
- Smith, Rebecca, Leberstein, Sarah 2015: Rights on Demand: Ensuring Workplace Standards and Worker Security in the On-demand Economy, in: National Employment Law Project, September 2015.
- Staub, Harald 2013: Shareconomy: Der Terror des Teilens, in: Frankfurter Allgemeine Zeitung, 22.12.2013.
- Stone, Brad 2012: My Life as a TaskRabbit, in: BusinessWeek, 13.9.2012.
- Strube, Sebastian 2014: Crowdwork: Vom Entstehen der digitalen Arbeiterklasse, Radiobeitrag, Zündfunk, Bayerischer Rundfunk, 16.3.2014.
- Sundararajan, Arun 2015: The „Gig Economy“: is Coming. What Will it Mean for Work?, in: The Guardian, 26.7.2015.
- Surowiecki, James 2015: Gigs with Benefits, in: The New Yorker, 6.7.2015.
- Swarns, Rachel L. 2014: Freelancers in the „Gig Economy“ Find a Mix of Freedom and Uncertainty, in: The New York Times, 9.2.2014.
- Tanz, Jason 2014: How Airbnb and Lyft Finally Got Americans to Trust Each Other, in: Wired, 23.4.2014.
- Taylor, Astra 2013: The People's Platform: Taking Back Power and Culture in the Digital Age, London.
- Taylor, Colleen, Ha Anthony 2013: TaskRabbit Confirms Layoffs As It Realigns to Focus on Mobile And Enterprise, in: TechCrunch, 8.7.2013.
- The Economist 2014: Should Digital Monopolies Be Broken Up?, 29.11.2014, <http://www.economist.com/news/leaders/21635000-european-moves-against-google-are-about-protecting-companies-not-consumers-should-digital> (13.8.2016).
- The Economist 2013: The Workforce in the Cloud, 1.6.2013, <http://www.economist.com/news/business/21578658-talent-exchanges-web-are-starting-transform-world-work-workforce> (13.8.2016).
- The Economist 2015: There's an App for That, 3.1.2015, <http://www.economist.com/news/briefing/21637355-freelance-workers-available-moments-notice-will-reshape-nature-companies-and> (13.8.2016).
- Thompson, Derek 2013: Airbnb CEO Brian Chesky on Building a Company and Starting a „Sharing“ Revolution, in: The Atlantic, 13.8.2013.
- Tortorici, Dayna 2013: More Smiles? More Money, in: n+117 (2013).
- Tufekci, Zeynep; King, Brayden 2014: We Can't Trust Uber, in: The New York Times, 7.12.2014.
- Weber, Lauren 2015: What if There Were a New Type of Worker? Dependent Contractor, in: Wall Street Journal, 28.1.2015.
- Weber, Lauren, Silverman, Rachel E. 2015: On-demand Workers: „We Are Not Robots“, in: Wall Street Journal, 27.1.2015.
- Westhale, July 2014: Gig Economy: How Technology Is Changing the Workforce, in: Launchable, 16.4.2014.
- Wong, Jamie 2012: The Rise of the Micro-Entrepreneurship Economy, in: Co.Exist, 29.5.2012.
- Wong, Julia Carrie 2016: Airbnb: How US Civil Rights Laws Allow Racial Discrimination on the Site, in: The Guardian, 6.5.2016.
- Zacharakis, Zacharias 2016: Foodora: Die pinkfarbene Verführung, in: Die Zeit, 7.6.2016, <http://www.zeit.de/wirtschaft/2016-06/foodora-lieferdienst-essen-geschaeftsmodell> (13.8.2016).

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