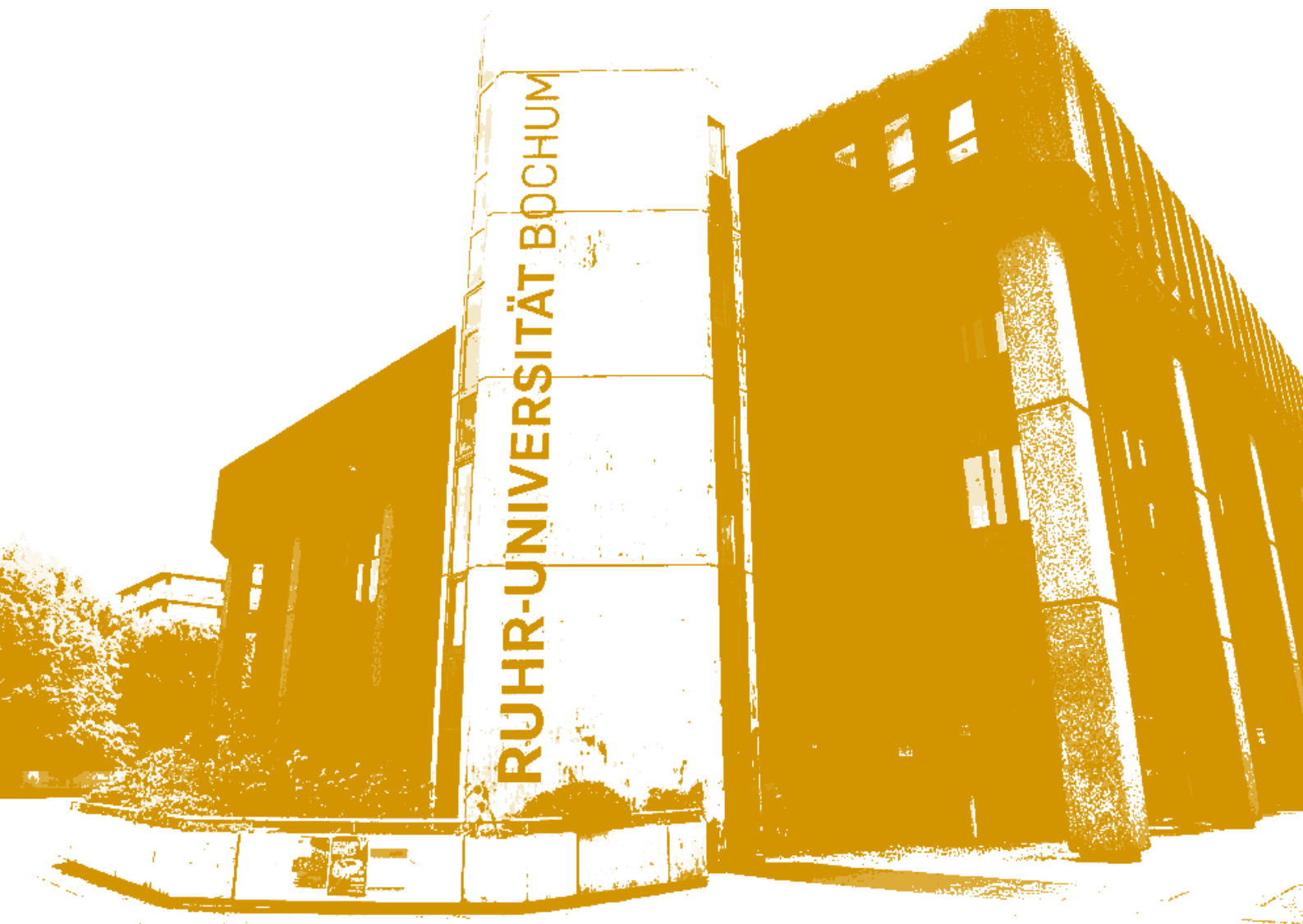*Markus Hertwig & Christian Papsdorf*

What Shapes Work on Online Labour Markets?
A Systematic Literature Review

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Abstract

This discussion paper analyses work on online labour markets and digital platforms using a systematic literature review and qualitative content analysis. Given a growing body of literature, the aim is to systematise the features and antecedents of platform work. To this end, 235 publications published between 2010 and 2020 are examined to pursue the following research questions: which dimensions of work are addressed by current studies? Which actors and institutions shape work, and in which ways? The article analyses the state of research on the factors influencing platform-based work and identifies causal relations as well as research desiderata. It offers a heuristic that systematises existing research results and relates them to each other. The findings show that platforms (as technical and organisational systems), customers and crowd work communities have a decisive influence on various aspects of work. The study contributes to a better theoretical understanding of platform labour.

Zusammenfassung

Der Beitrag umfasst eine Systematic Literature Review sowie eine qualitative Inhaltsanalyse von Online-Arbeitsmärkten und der dort vermittelten Arbeit. Vor dem Hintergrund einer unübersichtlichen Literaturlage besteht das Ziel in der Analyse und Systematisierung der Besonderheiten von Plattformarbeit. Dafür werden 235 zwischen 2010 und 2020 erschienene thematisch relevante Publikationen daraufhin untersucht, (1) welche Disziplinen mit welchen Methoden in welchen Kontexten plattformbasierte Arbeit erforschen; (2) welche Dimensionen von Arbeit sie thematisieren; (3) welche Akteurinnen und Akteure und Institutionen Arbeit prägen; und (4) auf welche Art und Weise sie dies tun. Der Beitrag analysiert den Stand der Forschung zu den Einflussfaktoren plattformbasierter Arbeit und identifiziert Forschungsdesiderata. Zudem bietet er eine Heuristik an, die die oftmals kleinteiligen Forschungsergebnisse systematisiert und aufeinander bezieht. Die Ergebnisse zeigen, dass vor allem Plattformen (als technische und organisatorische Systeme), Kundinnen und Kunden sowie die Community der Tätigen als neuartige Prägekräfte verschiedene Aspekte von Arbeit maßgeblich beeinflussen.

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1. Introduction

One key element of the recent digital transformation is the emergence of a so-called "platform economy" that encompasses a variety of business models and services mediated by digital platforms on the internet (Dolata, 2019; Srnicek, 2017). In the debates on the digital transformation of modern societies, platforms are in focus in their role as online labour markets and virtual places for digital, platform-based work (Schmidt, 2017). The central feature of this platform economy is the mediation of work orders, which are assigned by customers (alternatively: clients or requesters) via online platforms, to so-called crowd workers (also: click or gig workers). Those "gigs" are then carried out either "offline" (for example as a courier, delivery or overnight service) or "online" (i.e. on the platforms themselves, for example as so-called "click work"). Platform-based work has characteristics that in many respects fundamentally distinguish it from activities and forms of work within the traditional economy (e.g. Wood et al., 2019a).

These particularities of platform-based work have attracted a great deal of scholarly attention in recent years. The studies available differ considerably in terms of their objects of investigation, but also in terms of the scope and analytical depth of their findings. There is widespread agreement that the platform economy brings with it diverse, yet ambivalent and contradictory changes (Crouch, 2019; Srnicek, 2017). The tenor of existing studies is also that the observed phenomena can be traced back to the special features of the platform economy. The specific new influence on work lies in the dimensions of "communities" and "platforms", which naturally play no role in traditional employment. In this context, communities are understood to be internet-based communities that primarily comprise the workers, but also in part "peers", users or "customers". Platforms as socio-technical systems are examined in their functions as technical structures and economic actors with their own profit interests. In the research landscape, an overarching narrative can be identified that is able to explain the particularities and (mis)developments of digital platform-based work (Schor & Fitzmaurice, 2015). Within this framework, the strategies of platform companies, the power and dependency structures of digital markets, the specific orientations of crowd workers, as well as the discourses and cultural patterns of the internet communities create an effective, but at the same time still obscure field of forces.

Against this background, this study examines the characteristics and formative forces of work mediated by and/or performed on digital platforms. The aim is to analyse the specifics of digital work and the underlying causal factors on the basis of a systematic literature review (Snyder, 2019). A systematic review of existing findings is particularly suitable here, as there

is a large number of previously unrelated research findings on the topic.[1] In the sense of a comprehensive review, this article first analyses existing articles meta-data as it examines the disciplines, topics and research methods employed in the field. Secondly, we focus on the contents of existing studies. Research results are first abstracted and theorised by analysing across all studies (a) which dimensions of platform-based work are researched and (b) which factors (in the sense of actors and institutions) influence platform work. The analysis is based on 235 articles from various disciplines published in English-language journals between 2010 and 2020. The specific contribution of our study is to bring together the diverse findings and, on this basis, to develop a theoretical systematisation that can be instructive for future research as well as for diagnoses of social dynamics and socio-political challenges.

The following section outlines the subject matter as well as the related terms. The third section presents the methodology and the sampling process. The results for both sets of questions are then elaborated and discussed in the fifth section. The article concludes with a summary and outlook.

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[1] Nine literature reviews on platform-based work in the broader sense are available so far. Only a few studies (Ertz & Leblanc-Proulx, 2018; Gol et al., 2019) go beyond the analysis of bibliometric and sociometric data (Kaine & Josserand, 2019; Wazny, 2018).

2. Platform work

Digital work on online platforms is variously referred to as crowd work, click work, gig work or work in the sharing economy and has been subject to a growing number of studies. The work contexts in focus have a number of common features, such as the need for a digital infrastructure, the implementation of ratings and monitoring algorithms, or atypical employment relationships. Our analysis refers exclusively to those platforms that constitute labour markets or organise the work of a crowd. Platform-based work (Greef et al., 2017; Maier et al., 2017) therefore refers to work activities that cannot be realised without a digital platform in the sense of a labour market. On the one hand, platform-based work is performed within the framework of an online variant as "remote work" (location-independent); on the other hand, "offline work" is merely mediated and organised by the platforms, but then performed in the real world, like food delivery (location-based).

The platforms have two functions in the sense of socio-technical systems: First, they are technical structures in which action-relevant rules and structures are inscribed (Gould et al., 2016). Platforms have the power to define rules and, as a consequence, assume "quasi-sovereign" tasks structuring and regulating online labour markets (Dolata, 2019, p. 194). Second, the platforms themselves are economic actors pursuing their own profit interests (Postigo, 2016).

Another entity in platform-based work to be examined here are communities. These are more or less structured and defined groups of individuals that "as they mature, (…) generally begin to exhibit certain institutional characteristics, such as conventions, values, standards and knowledge structures, that shape the behavior of their members, mark the boundaries of the community, and foster a certain identity. " (Dolata & Schrape 2014, p. 18). Communities are constituted, for example, in platform forums through communication. They shape work with rating systems, but also in a more subtle way, by imposing cultural expectations and norms on their constituents.

3. Research Strategy and Sample

A systematic literature review differs from a "classical" review of the state of research in its thoroughness, stringency, structure (Okoli, 2015, p. 879; Snyder, 2019, p. 333). Following Snyder's (2019, p. 335) instructive tripartite division into systematic, semi-systematic and integrative reviews, the present research question is addressed within the framework of a semi-systematic literature review. This allows for the exploration of topics that have not been

clearly delineated so far. The text corpus is evaluated within the framework of a qualitative content analysis (Mayring, 2008).[2]

The review is based on a search in the publication database Web of Science, which is the largest of its kind and had more hits on platform-based work than other databases. At the end of November 2020, the literature search was conducted using the terms "crowd work", "gig work", "work sharing economy" and "work crowdsourcing". In addition, "work" was replaced by "labour/labor" in each case. The hits were limited to English-language papers in journals and proceedings published between 2010 and 2020. The 5,373 publications resulting from the search were sorted by "relevance". This is a ranking system that takes into account the occurrence of the search terms in the title, abstract and keywords. The publications were exported in this order, including all bibliometric data and the abstracts. The title and abstract of each publication were then read by both authors in descending order and those publications that clearly did not deal with platform-based work were removed from the sample. This was done in batches of 50 for the first 1,800 publications. After that, the proportion of potentially relevant publications fell so sharply that, for reasons of research economics, the remaining publications were not reviewed. Of the first 50 publications, 43 were potentially relevant, whereas only two of the last package were. In the subsequent work steps, a theoretical saturation also became apparent within the framework of the first 1,800 publications. Of the 450 remaining publications, six were excluded because they were duplicates. Eleven others were removed because they were not articles or proceedings. The remaining publications were downloaded as full text, with seven publications not being available, neither digitally nor in print. In a second selection step, the introduction, results section and discussion chapter of each of the remaining 426 publications were read to identify publications that were actually relevant. If this was not sufficient as a basis for decision, the complete publication was analysed. In this step, the MAXQDA software was used to code firstly bibliometric data, secondly the methodological procedure of the study and thirdly the dimensions of work investigated together with the findings. The result is a sample of 235 publications.

Publications were excluded that only indirectly address the topic of work, for example by analysing discourses or exploring hypothetical potentials, and lack a focus on work, for example because the address the effects of platforms on customers. On the other hand, publications that are not based on empirical research but develop their results theoretically were also included. After a first coding round, all publications were coded again in detail with regard to the influencing factors. The step of synthesising the publications was carried out within the framework of a qualitative content analysis (Mayring, 2008), which was realised inductively.

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[2] The Systematic Literature Reviews by Kaine and Josserand (2019) and Gol et al. (2019) provide an initial overview of the state of research. Studies can also be found on this, but they tend to focus on the general effects of the platform economy or platform capitalism on the development paths of modern societies.

Figure 1: Number of publications per year

Number of publications from 2010 to 2020 (n=235)
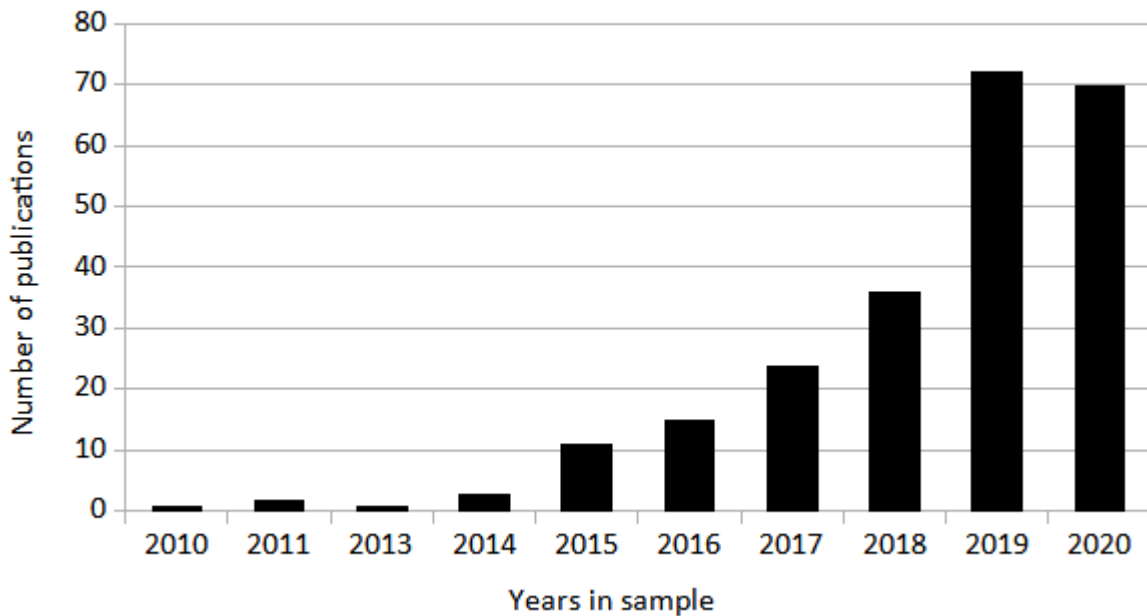
Own compilation

The number of thematically relevant publications has grown significantly over the years. Up to 2015, only a maximum of three studies are found in our sample each year, after which the numbers rise to 72 (Figure 1). The data were retrieved at the end of November 2020, so we can assume an increase for the entire year 2020 compared to in 2019.

The disciplinary location of the research was determined by the first author's institute affiliation. It shows a concentration of 71 percent of the relevant publications on the topic in three subjects. While economics and social sciences often deal with core dimensions of platform-based work, the other disciplines often address complementary aspects. Media and communication sciences, for example, pursue the role of social media or data protection, laws and political sciences explore issues of political regulation of digital work, (human) geography primarily examines the new spatial constellations, and the engineering sciences analyse workloads and security risks, for example. Surprising is the high proportion of publications from computer science, which is dedicated to the design of platforms, but also their impact on work.

With regard to the methods used, a share of 26 percent of theoretical publications contrasts with a share of 74 percent empirical studies. Within the empirical studies, qualitative research designs account for 46 percent, quantitative approaches (including simulations) for 39 percent and mixed methods for 15 percent. Thus, platform-based work is a research topic that is apparently explored in many aspects with recourse to reactive data (for example, in the context of interviews) and non-reactive data (for example, in the form of information on platforms

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and websites). However, a detailed examination shows that research often investigates specific aspects with relatively small numbers of cases over very short periods of time or with a focus on individual platforms. Triangular research, panel studies and comparative studies are an exception.

Almost 40 per cent of the publications do not refer to a specific region or do not indicate in which region the research took place. This often concerns theoretical work. The remaining publications primarily research platform-based work in the Americas (48 studies), here predominantly in the USA and occasionally in Canada, Chile and Brazil. The 34 studies that explore Asia focus on platform-based work in China, India and Japan. The 28 studies on platform-based work in Europe are spread across 18 countries, with no country dominating. Australia and Africa are rather neglected as research contexts, while 16 studies realise an intercontinental comparison.

Figure 2: Number of publications per sector

Number of publications per sector (n=235)
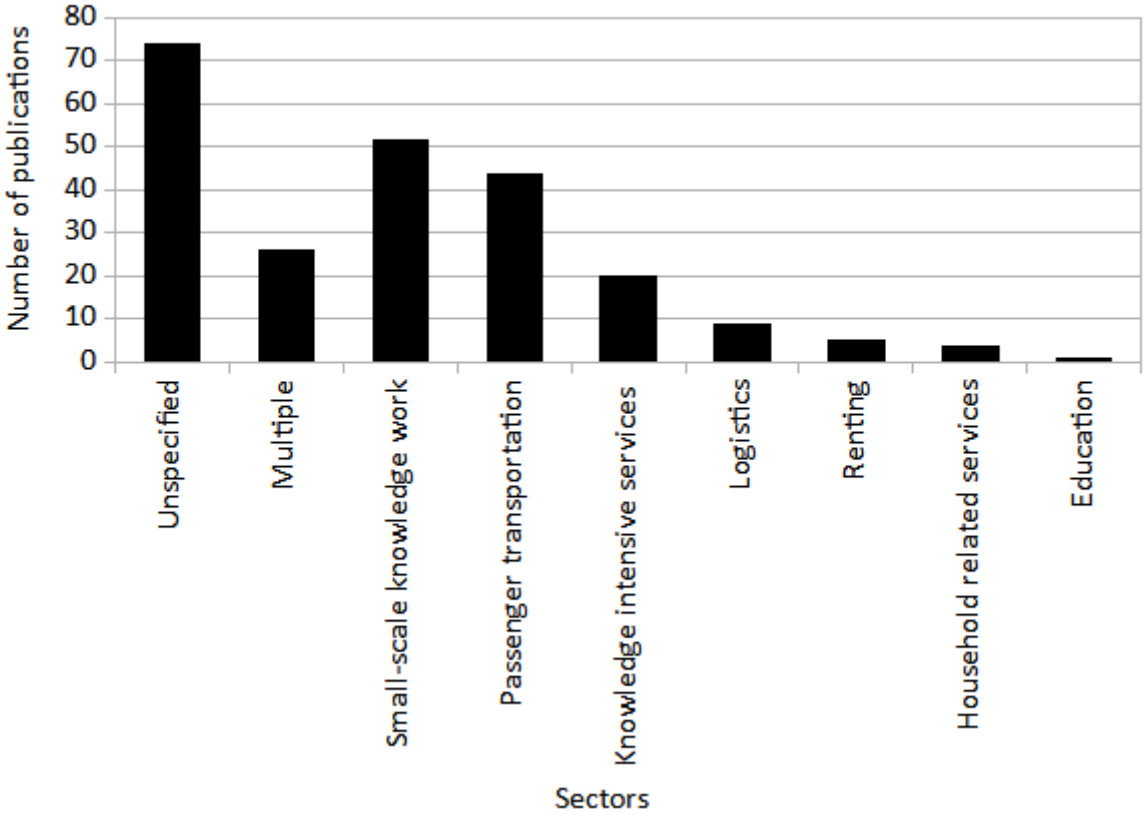
Own compilation

The evaluation of crowd work activities (Figure 2) indicates, analogous to the geographical research context, a high proportion of non-specific publications as well as a relatively large number of publications that look at several sectors. This is (theoretical) research on

crowdsourcing, the sharing economy or the gig economy as a whole. The remaining publications concentrate on three dominant and four rather marginal fields of activity. For example, small-scale activities are primarily researched on the click working platform Amazon Mechanical Turk and in Uber, Lyft and similar services. Only 20 studies focus on knowledge-intensive services like software development and design. The field of logistics includes food delivery services and courier services (9), while renting is almost exclusively limited to private space. The provision of cleaning, care workers and private cooks as well as academic teaching is only represented in rudimentary form. The majority of research focuses on the "lighthouse" platforms and sectors, while the existing diversity of fields of activity has hardly been investigated so far (Papsdorf & Hertwig, 2021).

Finally, each 35 per cent of the publications refer to remote or offline work. Eight per cent are dedicated to both types of work, e.g. by comparing the working conditions of different platforms. (The rest being indecisive).

4. Results

We condensed the findings into a model (see Figure 3) that allows the individual studies to be analysed primarily in terms of their findings on cause-effect relationships. The limitations and weaknesses of this heuristic model are discussed in the fifth section. With the model, three groups of elements can be distinguished: (1) four distinct dimensions of work (with respective sub-dimensions) inductively elaborated from research, (2) actors and institutions as shaping forces, and (3) specific influencing factors on platform-based work. With the aim of reducing the complexity of the model, only the relationship between the influencing factors and labour dimensions that are dominant in the research were depicted. Interrelations, such as between platform companies and political actors (for example in the form of lobbying activities) or between the workers' income and welfare state structures were explicitly not taken into account.

4.1 Dimensions of platform-based work

In a first step, we inductively extracted the relevant dimensions of work that are addressed in the studies from the material and clustered them into four dimensions.

The first dimension is dedicated to the *context conditions* of work. Here, questions of legal regulation as well as approaches to the representation of interests by associations or civil society are addressed. It becomes apparent that similar challenges regarding the legal status of workers arise in many national contexts. Against the background of the diagnosed protection needs, national and supranational possibilities of classification are discussed in many papers.

We labelled the second dimension *preconditions of work*. Half of the studies in this cluster examine the motivations that lead people to pursue platform-based work. Studies show that most relevant motivations are (additional) income, flexibility and autonomy in the organisation of work. However, motivations intermingle with enjoyment of the work, opportunities to acquire skills, or escaping from unemployment.

Related to this are questions about the socio-demographic composition of the crowd. Here it becomes obvious that there are serious differences among platform workers, which depend in part on the requirements of the work activity (qualification, skills), the individual socio-economic context (living situation, household income, supplementation of existing atypical employment) and also the geographical location. For example, Wood et al. (2019a) point out that platform-based activities in some African countries help to acquire monetary resources (beyond subsistence resources) in the first place, with little risk of precarisation due to the socio-economic context (for example, differences in purchasing power and wage levels between Western countries and emerging economies).

Figure 3: Theoretical model
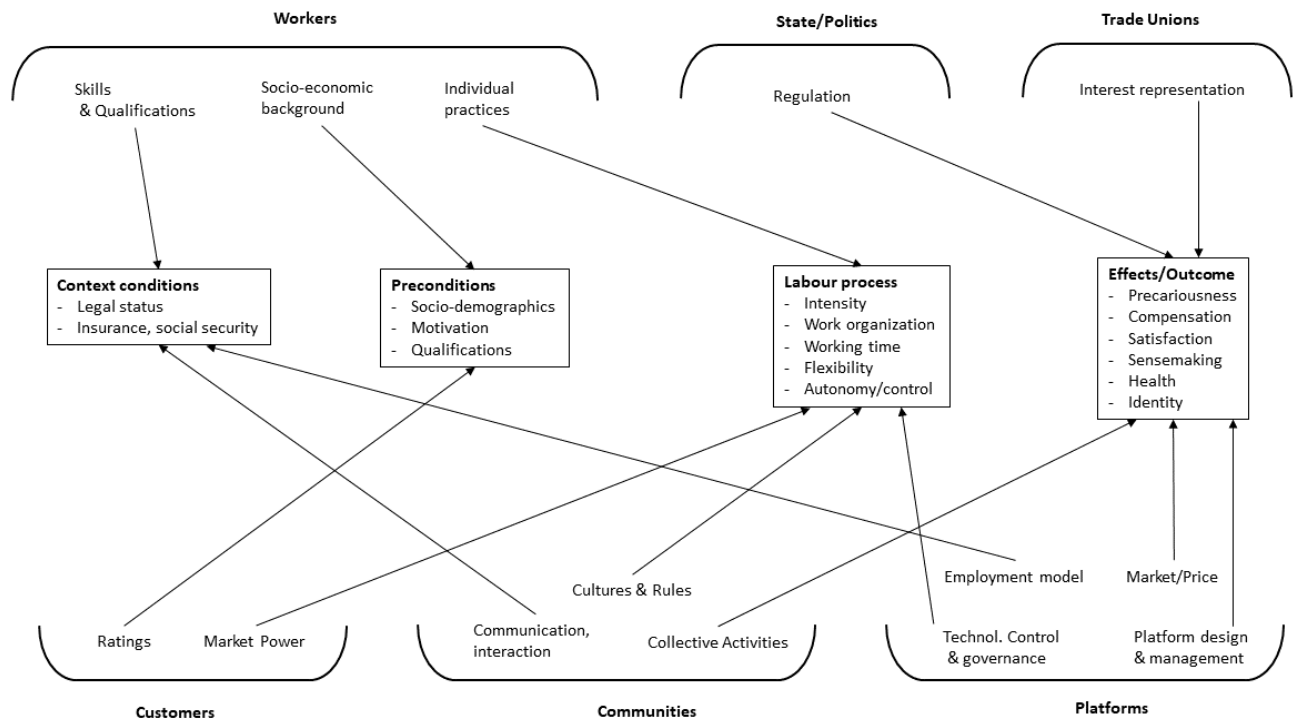
Own compilation

The third dimension is *labour process* and deals more specifically with work performance. One topic here is autonomy, including temporal autonomy, pricing, and entrepreneurial freedom. Closely related to this are studies on the connection between platform design and autonomy of the workers. Another important research topic is spatial and temporal flexibilization. This is not only about the possibility to organise working hours, but also about the volume of working time, work-life balance issues or the handling of deadlines. Spatial flexibilization is primarily examined regarding location-independent work.

By far the largest volume is on *work consequences or outcomes*, which is our fourth dimension. A large part of the studies research platform-based work from a precarisation perspective. The focus is on income issues, but also on the subjective experience (meaningfulness, alienation), health issues or work satisfaction. The research on stress focuses on physical and psychological challenges. In general, the discourse of precarisation in the field of platform-based work forms a kind of general theme, because aspects of precarisation are also researched in the other clusters identified here (for example, as participation in the legal-institutional system).

Although some topics have already been researched quite intensively (such as motives, legal framework conditions, work consequences), we find that these are more like snap shots of single sub-areas of the platform economy. In other clusters, for example regarding qualifications or professional biographies, there is surprisingly little research. All in all, the platform economy cannot be considered a sufficiently researched field. This applies even more to the question of how work is structured in the interaction of new and old actors and institutions. Questions about causal relationships are investigated in many studies. A systematic account of the factors influencing different clusters of platform-based work is the focus of the following section.

4.2 Factors influencing platform-based work

Based on our literature review, six influencing factors on platform work are introduced in this section. Three of them are factors that are well-known from research on traditional employment forms (with workers holding contract for work with an employer, working onsite in a firm): (1) state and politics, (2) associations (the studies about online labour markets that we analyzed were exclusively about trade unions and did not cover business associations), and (3) the workers themselves. We also identified new forces that are not relevant in traditional employment; those are the (4) platforms and (5) communities of workers. Another shaping force are (6) clients, requestors or customers, who also strongly influence work in some fields of traditional employment, but only in the case of self-employed workers.

In this section, the specific factors influencing the dimensions of work are modelled and discussed in a systematic way. The aim is to point out in which way each of the six institutions shape platform work. As a guideline that is informed by Giddens' theory of structuration, we distinguish between two levels (Giddens, 1984): The level of *action* focuses on activities and practices of platforms, communities, or actors and their effects on work. The level of *structures* addresses permanent patterns (rules and resources) that emerge or are changed in social practice.

4.3 Platforms: Digital control, employment model, price system and management

(1) A first way how platforms influence work is technological or digital control. It primarily affects work organization and work performance as well as consequences of work. A novelty regarding the work situation is the comprehensive real-time monitoring (Chen et al., 2020). New forms of control have a comparatively intensive effect, which in crowd work are precise to the click of a mouse and in ride services precise to the metre. In cloud work, they monitor workers with regular screenshots. Aspects of control can be seen in certain industries where algorithms are already able to evaluate work quality, classify workers and assign work, sometimes even without active consent (Veen et al., 2020). The algorithms, which are generally based on large amounts of data, represent black boxes for the workers (Heiland, 2019;

Rosenblat & Stark, 2016). This leads, among other things, to discrimination, for example by gender or nationality (Rani & Furrer, 2020). The effects of these control and steering structures are seen as detrimental to workers because they can result in a low income, social isolation, and exhaustion (Wood et al., 2019a).

Digital control also influences the composition of the crowd and individual employment opportunities, e.g. through conflict resolution mechanisms and gatekeeping strategies (Jarrahi et al., 2020), which include the algorithmically implemented blocking of workers. The outsourcing of management functions to clients via rating (Gerber, 2020) is also of outstanding importance. These are increasingly being used to automatically exclude workers from the online labour market, e.g. in the event of poor ratings or non-compliant behaviour (Chen et al., 2020; Wu et al., 2019). The platform often specifies the form in which profiles can be created, suggests descriptions, categories, or options for activities (Jarrahi et al., 2020).

(2) The "employment model" of the platform includes rules of market access and forms of employment established by the platform companies. According to the research, the employment model works as an influencing factor on the framework conditions and consequences of work. The employment status of workers is addressed in numerous publications. Platform-based work can in principle be organised as self-employment (Shade, 2018; Kaine & Josserand, 2019), as dependent employment or as a new type of hybrid (Arcidiacono et al., 2019; Koutsimpogiorgos et al., 2020; Minter, 2017). The choice is at the discretion of the platform companies. For instance, in food delivery, platforms have used and changed different employment models in a trial-and-error-process, at some point in time switching from self-employed to employed riders as a dominant form and vice-versa. The tenor of the interdisciplinary research is that there is a legal grey area deliberately designed by the platforms, which allows them to outsource risks to the workers while at the same time being able to exert control. Few publications address the legal or associational enforcement of regulations, such as a minimum wage for crowd workers in Australia (Minter, 2017).

(3) The "price system" includes rules of gratification or remuneration and thus contains fundamental mechanisms of price formation in online labour markets. This system has a significant impact on labour outcomes, namely earnings and precariousness. In many services (such as passenger transport), prices cannot be set by self-employed workers, but are set by the platform (Chen, 2018). This means that these are markets with an unequal distribution of power, in which platforms can in many cases influence not only prices but also market access and the number of providers. Platforms for delivery services and passenger transport work with flexible prices, bonuses, and earnings to guarantee sufficient labour supply during periods of particularly high or low demand (Wu et al., 2019). Similarly, prices are adjusted at short notice to prevent or mitigate the impact of strikes (Marrone & Finotto, 2019). The priority of many platforms is to keep costs as low as possible for customers, while the economic interests of workers are treated as secondary (Mäntymäki et al., 2019).

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(4) The "management of platform processes" is the action-related component of the influence factor platform. Few studies take into account that the three influencing factors mentioned so far are the results of (management) decisions and thus contingent, but also that an established platform design certainly leaves room for different styles of management or human resource management (Ravenelle, 2019a).

The platform management defines the basic communication and action possibilities of the workers and is found to impact on all four dimensions of work. Work outcomes (Ho et al., 2015; Weidema et al., 2016) and job satisfaction depend on the autonomy that is granted to workers (Barashev & Li, 2019; Kim et al., 2018). In this regard, opportunities and restrictions in communication have been researched relatively intensively. The studies in our sample unanimously document that communication between workers and customers (Schörpf et al., 2017), between workers and the platform (Wentrup et al., 2019) and in the community of workers (Gegenhuber et al., 2021) is designed in such a way that it can only take place within the platform. Furthermore, communication is limited to those functions that are directly beneficial to the performance of work. As a result, workers are isolated and it is difficult to represent common interests (Wells et al., 2020). The design of many platforms results in an asymmetry of information and, thus, also power in favour of the platforms (Heiland, 2019; Rosenblat & Stark, 2016), while crowd workers are subject to increased competitive pressure due to the high transparency of their work and references (Chen et al., 2020; Shibata, 2020).

4.4 Communities: Communication, culture, solidarity, and collective action

With regard to communities, too, distinguishing between action-related and structural factors of influence appears helpful to understand how communities influence work: Through (1) communication and exchange relationships, communities form (2) cultural patterns and systems of rules (such as solidarity), which in some cases (3) promote collective action.

(1) A characteristic feature of platform-based communities is that they are constituted through communication (among the crowd workers and between crowd workers and users). This process has a direct impact on the preconditions of work because platform-mediated communication (Chan, 2019) fosters workers identification with "their" community (sometimes also with the platform they work for most of the time) (Panteli et al., 2020). Mutual support among crowd workers (via social media or forums) strengthens the sense of belonging to the community (Gray et al., 2016; Hertwig et al., 2019; Ihl et al., 2020). Experienced crowd workers provide support to new community members and those in need of help. This ranges from guidelines on platform use to efficient work design and warnings about unreliable clients (McInnis et al., 2016). This assistance is usually provided without direct compensation (Wood et al., 2018).

(2) Through communication and interaction, communities form cultural patterns and systems of rules (Berger & Luckmann, 1966), which directly influence the performance of work because those involved orient themselves to the normative standards of the community (Duhaimer & Woessner, 2019; Fitzmaurice et al., 2020). In this way, communities contribute to the formation of collective orientations and practices (Maffie, 2020).

If crowd workers perceive their activity as "meaningful" (to which the community can contribute), motivation is supposed to increase (Ihl et al., 2020). In this way, however, communities provide services that also benefit the capitalist platform companies (Gerber, 2020).

The institutionalised cultural patterns of some communities work as a cultural counter-design to the prevalent market logic of the platform economy (Fitzmaurice et al., 2020). Communities can provide coping practices that reduce the information deficit of workers (Chan, 2019), mitigate exploitative practices and may even raise collective consciousness and generate solidarity (Panteli et al., 2020; Ravenelle, 2019b; Wood et al., 2018). In this way, on the one hand, they may generate preconditions for resistance; on the other hand, however, communities can reduce the willingness to resist by increasing workers' resilience to precarious working conditions (Soriano & Cabañes, 2020).

(3) In this context, several studies have documented spontaneous and longer-lasting forms of protest that are ignited by collective grievances. Those include the classic repertoire of industrial action such as work stoppages and strikes (Chen, 2018). Nevertheless, these are adapted to the platform context: For example, when Uber drivers collectively log out of the app and are thus no longer available at peak times, they can exert some degree of labour market power (Chesta et al., 2019). In the case of platform-based offline work, such processes are more likely than in the case of online work, because workers can meet and interact in urban spaces. If platforms prescribe specific work clothes, they even perceive each other as belonging to the same platform (e.g. as food delivery workers) (Briziarell & Armano, 2020; Chesta et al., 2019, p. 830;).

Specific forums are a central medium of communication in communities, and thus also relevant for the formation of solidarity and collective actions. In part, proprietary platforms are set up by a community (such as forums or the "Turkopticon"; Irani & Silberman, 2013), but in part (semi-)public social media applications are also used for communication (Whatsapp or Facebook groups; Carmody & Fortuin, 2019). Via digital media, workers exchange views on the conditions of their work and thus generate the collective perception of grievances as well as feelings of identity and solidarity (Soriano & Cabañes, 2020). The reason for communicating with the online community is often conflict with clients, for which workers hope for support in the community (Maffie, 2020).

The unique nature of platform-based work poses specific challenges to communities that make collective action particularly difficult: (a) a virtual and thus impersonal work

environment; (b) a global labour market and the accompanying national fragmentation; (c) a variety of tasks and occupational diversity; (d) the fear of workers of being sanctioned by platforms or clients due to collective engagement; (e) counter-strategies by platform companies; and finally (f) fluid and short-term employment which is intended by many workers, but renders long-term collective engagement irrational (Barratt et al., 2020; Gegenhuber et al., 2020; Howcroft & Bergvall-Kåreborn, 2019).

4.5 Customers, users and peers: reviews, ratings and customer power

Customers, consumers, and clients of platform-based activities do not form a homogeneous group: they range from private companies that place orders on Amazon Mechanical Turk or Upwork, for example, to individuals who take advantage of accommodation on Couchsurfing and perceive themselves as "peers" in a community of like-minded people. What customers, consumers or clients have in common is that they define standards of platform-based work in the process of consumption and through evaluations. Thereby, they contribute significantly to the structuring of the field.

According to the literature, customers and clients exert power over crowd workers. On the one hand, this results from the oversupply of labour on many platforms. On the other hand, power asymmetries stem from the structures, rules and resources provided by the platforms (Kinsgley et al., 2015). For example, platform companies design rating systems for customers to rate those who work, but rarely the other way round (McInnis, 2016). Rating systems are generally considered essential to the functioning of the platform economy, as they help to convey essential market signals within an anonymous and spatially disembedded relationship (Gandini, 2020). By conveying information about skills and qualifications, but also general impressions about trustworthiness or the expected quality of services, they influence work quite significantly. Some platforms give customers the option to reject work results (due to perceived quality deficiencies). If this happens, crowd workers often do not receive any remuneration (McInnis et al., 2016).

Although evaluations are sometimes reciprocal, evaluation systems primarily have a disciplinary effect, as they ensure that employees behave in a "socially desirable" manner when performing their work, since the acquisition of future contracts often depends on reputation (Gandini, 2020).

4.6 Crowd workers: Skills, socio-economic background and individual practices

(1) By developing and activating the necessary skills or qualifications required for certain jobs, workers can influence their access to jobs. Hence, they somewhat shape the preconditions of work. There is a dynamic relation between qualifications and jobs because specific skills are a

prerequisite for obtaining certain jobs; however, work practice in turn affects the skillset and thus influences employability (Barnes et al., 2015).

(2) The socio-economic background of workers plays an important role, as it influences the dependency and market power of workers as well as the consequences of work in the form of earnings opportunities (Peticca-Harris et al., 2018): precarisation risks arise especially for workers "who are new to gig work; belong to disadvantaged socio-economic backgrounds; lack educational qualifications and do less-complex work activities such as transcription, data entry and search engine optimisation" (Anwar et al., 2020a, p. 17). In online labour markets, pricing is rarely an open and dynamic process, as the pricing system is defined by the platform companies. Only in certain cases, such as programming or design tenders, are actors involved in setting prices or bids (Jäger et al., 2019).

(3) Dealing with problematic working and employment conditions is the subject of some studies that focus on individual (coping or subversive) practices (Anwar et al., 2020b). Workers develop such practices to resist adverse and disadvantageous working conditions. These include creative forms of coming to terms with or even circumventing the requirements and rules of the platforms (Sutherland et al., 2020). Workers themselves use digital tools as a "practice of multi-homing and using bot apps [...] to manipulate and to gain an advantage over the digital platform" (Chen, 2018, p. 2706).

The transition from individual coping practices to collective community action has not been researched at expense yet. Existing studies show that individual subversive practices are able to spark collective resistance: for example, some workers have developed software scripts, e.g. to bypass repetitive work, automate work steps or receive job alerts. Those scripts are often made available to other workers, indicating a collective stance (El Maarry et al., 2018). In this way, it is possible to (collectively) subvert the rules of the platforms and the strategies of the clients (Anwar et al., 2020b). The mutual assistance of those active and the embedding in a community can thus be a significant catalyst for subversive practices.

4.7 Trade unions: collective organizing and countervailing power

Trade unions shape working conditions as they build "countervailing power", develop collective actions that bring platforms and customers to change their behaviour, or conclude collective agreements that regulate employment conditions. The formation of countervailing power is seen in the publications as a prerequisite that is hard to achieve. On the one hand, collective organizing falls under competition and antitrust laws because crowd workers are, according to the prevailing legal interpretation in many countries, self-employed (Shade, 2018; Kaine & Josserand, 2019). Accordingly, the core business of trade unions - negotiating collective agreements - is not addressed in any of the studies we looked at. On the other hand, crowd workers have an individualistic work orientation which makes it difficult to reach collective forms of

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organisation: studies show that some workers would like to be represented by a trade union, but do not know how to go about it (Anwar et al., 2020a). In a representative survey across different European countries (Newlands et al., 2018), only ca. 30 per cent of crowd workers said that workers in the platform economy should have their own trade union. The authors identify different groups among the workers, some of whom are even strongly opposed to collective organisation. The specific orientations are attributed to the organisation of work and labour market processes, such as the fluctuation and oversupply of labour, the lack of personal contacts in online work, but also the specific ideology of freedom in the platform economy (Newlands et al., 2018). Other possible causes are the fragmentation of workers based on nationality, profession or platform (Wood et al., 2018; Al-Ani & Stumpp, 2016). Again, communication within the community is an important factor, as it may foster positive views, framing of grievances, and ideas of collective organisation (Maffie, 2020).

There are approaches to the regulation of platform-based work by associations in several countries. In Australia, for example, there are attempts by trade unions to install minimum wage obligations or arbitration tribunals together with state authorities (Minter, 2017) and to use these to influence the conditions of work and the consequences of work.

4.8 State regulation, politics, and the legal framework

State regulation may significantly influence many dimensions of platform-based work, like conditions of work (e.g., the legal status of crowd workers), the performance of work (e.g., occupational health and safety requirements) and the consequences of work (e.g., through welfare state regulation). The research on state regulations is firstly dedicated to the question of whether such regulations are possible at all in the context of platform-based work. Some contributions argue that dependent platform work is in principle just as strongly regulated as traditional work (Koutsimpogiorgos et al., 2020; Zou, 2017), as the same laws and regulations apply. However, their enforcement is difficult due to the lack of national localisation of certain activities (Graham et al., 2017). Moreover, this is only the case for employees in the traditional sense. By contrast, workers classified as self-employed are not covered by labour protection and welfare state regulations (Chen et al., 2020). Whether state regulations gain access to platform-based work still depends on the legal classification of platforms.

Secondly, the publications address the negative effects of (missing) state regulations. For example, there is a lack of health care (Wood et al., 2019b), an inadequate working environment, work equipment, additional benefits from employers (Jacques & Kristensson, 2019) or social security benefits (Corujo, 2017).

In sum, research on platform-based work offers many empirically well-documented insights into the different dimensions of crowd work. Nevertheless, the causal effect of the six influence factors we distinguished here has not been considered systematically. Research often

has a clear focus, for example, when studies tend to zoom in on the influence of platforms through technical-organisational rules, thereby neglecting the underlying interests of the platform companies and other shaping forces. In addition, "soft" factors, such as framing processes inside communities as well as the differentiation between structural and action-related elements have only been addressed in rudimentary form yet.

5. Discussion: Institutional Accounts to Platform Work

Platforms, which constitute online labor markets or virtual workplaces, are novel, complex and highly dynamic social fields that are often structured transnationally and have so far hardly been regulated in legal terms (by labor law or collective agreements). In order to answer the question of how platform work can be made more social, humane and sustainable, it is first necessary to ask what factors influence platform work.

Structuration theory (Giddens, 1984) points out that social practices, social structures and institutions develop dynamically over time. It explains social practices - and this includes the varieties of platform work - as the result of actions and structures, whereby both entities are inextricably interwoven; for according to Giddens - and in contrast to one-sidedly subjectivist and objectivist theories - structures only come into being through actions; at the same time, however, actions never take place voluntaristically, but are shaped by structures and draw on structures. This happens in that individuals interpret social phenomena in certain ways, orient themselves (usually preconsciously) to social norms, and activate certain sources of power for their decisions to act. From a structuration theory perspective, what is sociologically called "embeddedness" is obvious (Granovetter, 1985; Polanyi, 1957): Markets and economic action, too, are never the outcome of purely individualistic cost-benefit calculations, but are always interwoven with and shaped by social structures, such as laws (labor legislation, competition law, etc.), but also informal structures such as customs, industry, professional and corporate cultures.

Similar arguments are made when it comes to the question of technology use (Bijker et al., 1987). Since the 1970s, research in the social sciences, and especially in the sociology of work, has elaborated in many empirical studies and theoretical papers that technologies do not emerge by themselves and then automatically change work and organization. How (and whether) assembly lines are used, for example, is always the result of a - usually entrepreneurial - decision, which in principle can also turn out differently. This does not mean that technology does not shape work. It does, but only after people have made a decision about how technology should be used. And even in phases of practical application of techniques, there is considerable leeway: Thus, techniques are sometimes used quite differently than originally intended; they are bypassed or used only partially.

These considerations point to an aspect that is often overlooked in the debate about platform work: Even supposedly unregulated work - as in the platform economy - is embedded in social structures, it is structured by institutions that are activated in action and can thus be reproduced or also changed (Giddens, 1984). This often appears different, because in the debates on the platform economy it is precisely the lack of state and association regulation that is criticized: Labor law does not apply to solo self-employed workers; unions cannot negotiate collective bargaining agreements; other union services are on the rise but still little used. But

non-regulation also produces a form of regulation, just as non-decision is a decision. For example, deregulation of temporary work during the 2000s produced precarious working conditions, whereas more recent re-regulations seek to contain negative effects. Thus, if disembedded work cannot exist even among the most largely unregulated forms of work, the question inevitably arises as to what forms of "embeddedness" are responsible for shaping work in the platform economy.

The sociology of work knows different concepts that can clarify the structuring of work. Analytically, five institutions can be differentiated that "structure" work in that actors refer to them in their actions (Pries, 2019). In classical gainful employment, these are companies and businesses as *organizations* and thus as places where labor is expended. It is here that central decisions about labor practices are made. The *market* as a place of matching supply and demand shapes gainful employment through specific mechanisms, dependency and power structures, but is also shaped by contract law, for example. State and association *regulation* form important framework conditions and define the scope of possibilities for companies and professionals. For example, the Passenger Transportation Act in Germany means that Uber is not allowed to implement its original cab business model. Another institution is *professions, which* bundle social norms regarding qualifications and activities, but also convey professional pride, prestige and behavioral expectations. Social *networks* can be understood as a final institution. These are durable (but not necessarily family-based) cooperative relationships based on trust and nonspecific reciprocity expectations (Pries, 2019, p. 23), which are based on social capital or group membership and codify practices of mutual support (in job search or even on the job). The meaning of individual institutions varies by field, region, or nation; the contents of institutions differ greatly in terms of norms and rules, but also in patterns of perception and notions of appropriateness or justice.

In the platform economy, we now observe a special constellation compared to many forms of classic gainful employment: Instead of classic, vertically integrated enterprises, we find organizations whose service is to operate web platforms, which function as labor markets and, in part, as places where labor is spent "on the Internet" (Papsdorf, 2019). The importance of organizations (operating sites and companies) in structuring work is obvious and undisputed in traditional industries. However, the influence is even greater in the platform economy. This is because platform companies can manage not only the operational expenditure of labor, but also, in addition to the product markets, the labor markets and thus both the access and usage conditions for workers and for customers (including companies), as it were autonomously. In the current phase, they are not overly constrained by either established professional or state-associated institutions.

Social networks are another institution that is of great importance in the platform economy. This is because the numerous Internet communities form their own structures and, above all, cultural patterns that shape the actors' interpretations, expectations of normality and also

opportunities for action (sources of power) (Dolata & Schrape, 2014). While social networks are central institutions for structuring gainful employment in many countries (Pries 2019), they have only been relevant in partial aspects in Germany. However, the platform economy is changing this. This is because "community networks" contain action-guiding norms and rules that act as substitutes for the less central institutions of occupation, market, state and organization in the platform economy. Values and orientations such as autonomy, self-realization, flexibility and experience gain are style-forming for many Internet communities. The culture, the "spirit" of the platform economy (following Boltanski & Chiapello, 2003) structures the subjective orientations of those active. It seems remarkable that these orientations do not emerge by themselves either: They are explicitly and offensively touted by platform companies as advantages of platform work; in the absence of a counter-design, a model of "good platform work," these advances of the platforms catch on. In line with the precarious socio-economic living situation of many people, this generates the necessary labor supply that the platforms need.

The institutions of state-association regulation (e.g., labor law and collective bargaining agreements) and occupational embeddedness that are significant in the traditional economy are essential for understanding platform work. This is because their design - the fact that they comprise only weakly institutionalized, ambivalent rules in the field of the platform economy - opens up such a sprawling array of powers to platforms. Because of the lack of restrictions, platforms are able to substantially structure both the labor markets for platform work and the performance of work, and to unilaterally determine the conditions of labor output. Platforms do not do this automatically - they are actors and include actors who make decisions or (must) negotiate decisions internally or with stakeholders; it is important to emphasize that even a perceived non-decision is a decision. It is therefore important not to view platforms as entities and black boxes, but to focus more on the actors.

6. Conclusions

Like traditional employment, platform-based work operates in a field of tension between different social structures, institutions, or systems. Based on our literature review, we distinguished six forces, each of which influences different aspects of work through its own mechanisms. The central result of the study is that, in comparison to classic employment, platforms and communities represent emergent forces that structure work by means of new, but also familiar, influencing factors. It is a characteristic of the platform economy that the two forces "platforms" and "communities" dominate structuring and take over the functions of the "classic" *institutions of the employment system* (see also Hertwig, 2021). By controlling work through decisions on work organisation, division of labour, working hours, control and remuneration systems, platforms act like companies; since the service of platforms consists in operating markets, they can structure the "market" through interest-led manipulation of market processes; thirdly, they also fulfil state tasks of "regulation", because they set rules for market access and market processes. Platforms thus combine the functions and services of several classical institutions and this is an important cause of their enormous power.

Internet communities – in the more narrow sense as platform related and more or less structured and coherent collectives – act as functional equivalents for institutions of occupation, state and association regulation and also social networks, which provide important structuring services within classical employment. However, the scope and effects vary greatly because some communities are only loosely connected, while others are well-structured collectives. Communities rarely reveal high levels of organization, and thus, they lack an actor's quality, clear goals and interests, resources and means. This distinguishes them from platform companies that are economic actors.

Although many studies consider the community as an important factor influencing work, this research focus is still little developed. This is partly because the subject is iridescent due to its complexity and conceptual indeterminacy (Dolata & Schrape, 2014). Our plea is to conceptualise communities in the context of platform-based work more systematically, to empirically survey characteristics and differences, and in this way to analyse the interactions between (different) communities and work practice. It is also interesting to see how platforms and customers actively use communities as a source of profit or rationalisation and how they use technology to manage workers and customers interaction (see also Gerber, 2020). This is also about uncovering the ideological function of communities and mechanisms of how communities perpetuate precariousness and exploitation. Here, it is an open question to what extent communities create new divisions (insiders/outsiders), since they only include parts of "crowds", i.e. those workers who for instance participate in online forums or chat groups (Hertwig et al., 2019). As collectives, communities offer the opportunity to develop organisational power (Schmalz & Dörre, 2014). But when do communities foster collective voice, and

when do they increase the resilience that has exactly the opposite effect and leads workers to accept precarious work consequences?

So far, little research has been done on (decision-making) processes within platforms that lead to the selection of a certain platform design. We therefore argue for a more action-theoretical perspective that understands platforms not exclusively as control systems that have coagulated into structures, but in their role as economic actors (companies) and as organisations (operations). Then it becomes apparent that algorithmic control systems are permanently (further) developed, and that they are the result of decisions, internal negotiations and thus also to micropolitical conflicts (Crozier & Friedberg, 1979). Likewise, the social embedding of platforms then comes more into view, and with it norms and expectations that influence economic action (Granovetter, 1985).

Finally, a result of our study is a theoretical modelling of the influences that affect and structure digital work. To understand platform-based work, we believe that a double perspective is indispensable, which on the one hand identifies the shaping forces and the influencing factors corresponding to them, but on the other hand takes into account that work is structured in a dynamic field of forces of different institutions and practices.
As a heuristic, the model - together with its six shaping forces, which have an effect on four dimensions of work via a total of 14 distinct influencing factors - is helpful in two respects. Firstly, it deconstructs in particular the new types of social entities (platforms and communities), which are identified in existing studies as central formative forces (or even determinants) of work, but remain largely a black box. Our analysis, on the other hand, allows us to identify more precisely the many socio-technical mechanisms that shape work through the specific influencing factors. By "zooming in" in this way, it becomes apparent, for example, that platforms set very different kinds of rules that go far beyond the purely technical-automated structuring of matching processes.

Our distinction between the levels of action and structures seems to make sense here (Giddens, 1984). Platforms shape work through their structures: for example the platform design, rules of technical control and governance, and the employment and price system. However, these structures are generated and shaped in social processes (Orlikowski, 1992), and furthermore, they have to be interpreted and used by actors in a specific way, whereby there is considerable scope for decision-making and "interpretative openness" (Bijker et al., 1987). Only this action-related view makes it clear that it is not only structures that influence work, but that within the structures there are different alternatives that are used and shaped by managers (for example, in setting prices or settling conflicts) or by customers (within the framework of evaluations, bonuses or "rejection") in their respective actions.

Secondly, the model - by "zooming out" - opens up a view of the whole field within which work is structured. Here we distinguish four systems which are constituted through the interplay of

different shaping forces: the regulatory system, the platform system, the personal system and the community system. It is precisely the interplay between those systems that makes the particularities of platform-based work understandable. For example, we can explain the negative consequences of platform-based work consistently diagnosed in the literature from the interplay of the different systems (with their individual influencing factors): A first aspect is the design of the relevant legal institutions, which is unfavourable for employees and the employment system. With regard to the regulatory system, there is a deficit in regulating platform work, the status of crowd workers under labour law, and also welfare state protection. These "gaps" are filled – or exploited – in the platform system: the decision-making rights of the owners and managers in the platform companies mean that regulations and mechanisms are designed in favour of the companies and customers (via the technical and regulatory design of the marketplaces). Located in the same system, it depends on the attitudes and practices of the customers whether the technical-organisational rules defined by the platforms are actually used to exploit the workers. In the personal system, dependencies, deficient welfare state protection and a lack of labour market opportunities cause the low market power of workers. The isolation of the work process makes collective forms of counter-power more difficult. The community system can ultimately cushion negative effects - through solidarity and collective action - but also intensify them if the cultural structuring of a community promotes the individual identification of workers with "their" job. Communities then contribute (as an unintended side effect) to the ideological stabilisation of the system of platform-based work.

Such a holistic view helps to uncover opportunities for change but does not expect them in the system of (deficient) political regulation only. Potential resilience factors undoubtedly lie in the legal system (labour and competition law), but also in the personal system (formation of qualifications, coping strategies, subversive resistance), in the development of collective-associational counter-power (representation of interests, strikes, industrial action), in the community (solidarity, cooperation) and also in influencing the strategies of the platforms, which as socially "embedded" organisations (Granovetter, 1985) may react quite sensitively to public opinion (Meyer & Rowan, 1977).

It must be noted that the model developed is only as meaningful as the underlying research. It was developed on the basis of a literature review that itself (for the time being) has research gaps. On the one hand, we only examined a part of the available publications, for example because book publications and other languages than English were excluded. On the other hand, however, it seems problematic that our heuristic is based on a state of research that must be assessed as incomplete. Thus, the heuristic only reflects the part of the reality of the world of work that has been researched so far and has found its way into our sample. It remains a reflection of the current situation in the digital economy, which – in view of the high proportion of publications within the last five years and the dynamics in the field – must be

regarded as changeable. Our observation is thus necessarily only a snapshot. A verification or modification of the model seems necessary in the foreseeable future.

In a practical view, our research yields recommendations for politics and unions. As companies and requesters largely monopolize institutional functions and power, an apparent strategy towards decent work is to bring regulatory power back to the state or other regulatory agencies. Current initiatives by the European Union should be recognized by national parties to gain momentum and drive the process further. Trade unions may increase their leverage by offering options to communicate, interact and finally organize. This can be done using digital technologies like forums or apps that currently are used by crowd workers on open forum like reddit. Also coalition building may be an option to link bottom-up initiatives with traditional trade union representation and activities, that has taken place in the FairTube campaign as a coalition between the German metalworkers union IG Metall and the so-called YouTubers Union (Hertwig & Witzak, 2022).

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