Trade Unions and Digitalisation in Germany

Thomas Haipeter[1]

Resumen. La revolución digital es un reto complejo para los sindicatos alemanes. Por un lado, esto se debe a los problemas generales del movimiento sindical alemán, por otro lado, la digitalización es un proceso de múltiples capas que se desarrolla de diferentes formas, desde la "Industria 4.0" hasta la economía de plataforma. Para hacer frente a estos retos, los sindicatos alemanes pudieron recurrir a nuevos enfoques estratégicos, basados en principios como la organización, la participación y la activación de los comités de empresa. Básicamente, los sindicatos alemanes intentan influir en la digitalización y sus efectos a partir de nuevas iniciativas. Mientras que la activación de los comités de empresa está a la cabeza de las iniciativas sindicales sobre la "Industria 4.0", las iniciativas en la economía de plataforma son más diversas, pero también más limitadas. Y mientras que la proliferación de comités de empresa constituye un límite para las estrategias de activación, las estrategias de plataforma están limitadas por su elevado esfuerzo y su relativamente menor rendimiento.
Palabras clave: Digitalización; Iniciativas sindicales; Industria 4.0; Economía de plataforma

[es] Sindicatos y digitalización en Alemania

Abstract. The digital revolution is a complex challenge for the German trade unions. On the one hand, this is due to the long-term process of weakening of the German trade union movement; on the other hand, digitalisation is a multi-layered process that is developing in different forms, ranging from the 'Industry 4.0' in the manufacturing sector to the platform economy. In addressing these challenges, German trade unions tried to draw on new strategic approaches based on principles such as organising, participation and the activation of works councils. Basically, trade unions are trying to influence digitalisation and its effects on the basis of new initiatives and, in doing so, to reposition themselves as interest representatives of workers. While the activation of works councils is at the forefront of trade union initiatives on 'Industry 4.0', the initiatives in the platform economy are more diverse, ranging from top-down approaches to grass-roots activities, but also more limited. And while the proliferation of works councils forms a limit for the activation strategies, the platform strategies are limited by their high costs and efforts compared to a relatively lower return.
Keywords: Digitalisation; Trade Union Initiatives; Industry 4.0; Platform Economy

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1   Director del Research Department on Working Time and Work Organization. University of Duisburg-Essen. School of Social Sciences. Institute Work, Skills and Training. Correo electrónico: thomas.haipeter@uni-due.de.

1. Introduction

This paper is about digitalisation and the question of how German trade unions cope with it as a new topic of trade union policy and strategy. How do trade unions in Germany interpret and frame digitalisation? What do the strategies they try to develop in order to improve the situation of workers or their own organisational power and resources look like? What might be the opportunities and limits of these strategies? These issues are of central importance for the German trade unions, as they are facing a long-term decline in organisational power and in collective bargaining coverage. This fact increases the pressure to develop solutions that at the same time are effective in collective bargaining or workplace bargaining – which in Germany is the responsibility of works councils independent from unions – and that improve the power positions of the unions itself.

The paper will analyse trade union action in two broader areas of the digital economy, which are at the centre of sociological interest on the digitalisation of work in Germany: 'Industry 4.0' and labour platforms. On the one hand, it looks at initiatives of trade unions in the industrial sectors that aim to shape and regulate 'Industry 4.0'. These initiatives are based both on close cooperation with works councils at establishment level and on a social partnership approach with regard to management. On the other hand, the focus is on initiatives by trade unions – and by employees in grass-root campaigns – in the newly emerging field of platform work, in which the trade unions try to establish themselves as interest representatives and to implement the core institutions of German labour relations, works councils and collective bargaining. While in the first case the paper is mainly about aligning the work of existing interest representation structures to digitalisation as a new and central challenge, in the second case it is about establishing themselves and the institutions of labour relations in a new sector of the digital economy.

The analysis on these two focal points of trade union strategies in dealing with digitalisation is based both on findings from literature and on findings from own research projects, which have been carried out in both fields. Before going into these concrete strategies in more detail, both a short description of the Germany discussion on digitalisation and a brief insight into the initial situation in which the German trade unions – and also works councils as employee representatives on establishment level – find themselves will be given.

2. Digitalisation and Trade Unions

The topic of digitalisation has gained central importance in discourse and strategies of the German trade unions since the beginning of the 2010s. Responsible for this was, above all, the concept of 'Industry 4.0', which was jointly developed by scientists and some company managements as a model for the industrial export sector during this time. The vision coupled with this concept, which was thus alarming for the trade unions, was that digitalisation in 'Industry 4.0' would lead to a radical technological break and a 'fourth industrial revolution'. (Arbeitskreis Industrie 4.0, 2012; Spath, 2013). The assumption is that 'cyber-physical systems' will develop which are described as encompassing networks of machines, products and people, driven by software and enabled through sensors and the application of Artificial In-

telligence (AI). AI has become a core issue of the discussion in German labour sociology in terms of its potentials and limits (Hirsch-Kreinsen, 2022), as well as the possibilities of a socio-technical design to combine AI and human labour in work systems (Gerst, 2019). Besides this, Industry 4.0' has also embraced discussion of new forms of robotics (Gerst, 2016) or digital assistant systems (Kuhlmann, 2018; Krzywdzinski, 2022; Falkenberg, 2021). Major transformations, such as those associated with digitalisation, are necessarily accompanied by profound challenges for work, employment and working conditions, but also for the way employee interests are represented.

If digitalisation will trigger a reduction in industrial employment or the undermining of agreed pay and conditions, then the organisational power and, maybe, the survival of trade unions seems to be at risk. As the manufacturing sector traditionally has been – and still is – the stronghold of trade unionism in Germany – with a trade union density of nearly 60% in the metalworking industry for example (Schroeder and Fuchs 2019) – this would affect the whole German system of labour relations. A serious loss of members due to a decline in the number of employees would undermine their membership base, and their image as successful collective bargaining actors seems to be acutely endangered. Digitalisation might also fuel the ongoing change of the composition of the workforce in favour of white collar employees which are much more difficult for the unions to organise than their traditional blue collar membership base (Haipeter 2016). Coping with 'Industry 4.0' for the unions also means to cooperate with the works councils as the interest representation of employees on the workplace level which can dispose of legal rights of information, consultation and participation and which are formally independent from the trade unions – although they are in fact quite highly organised by the unions. According to surveys, 40% of the works councils are looking for the support of trade unions or other forms of advice to deal with digitalisation (Ahlers 2018), and 65% of the works councils have become active to deal with this issue after they were educated by the trade unions (Lins et al. 2018). These figures show that the interaction between trade unions and works councils might be crucial for the latter to cope with the challenges of digitalisation.

However, the perception of the trade unions did not only focus on the vision of 'Industry 4.0'. More or less parallel to this, the gig economy and the problem of crowdworking also came into view as a central development of digitalisation. At first glance, the quantitative dimension of the phenomenon in terms of the number of employees affected by this development up to now is far from being clear, but the figures reported are rather low. According to different surveys made on the topic, the share of platform workers among the adult population ranges between 1 and 12% and the share of those doing this regularly between less an 1% and less than 6%, with the share of workers doing location-based services – gig working – being bigger than the share of workers doing online work – cloudworking – for the platforms (Hünefeld et al. 2021). Within the gig working part, the highest share of workers works in household services, followed by taxis and delivery services. Within the group of cloudworkers two types of platforms are distinguished, the microtask platforms like Amazon Turk on the one and the platforms offering qualified work like designing on the other hand (Funke and Picot 2021).

The findings on work and working conditions on labour platforms in Germany show that platform work is mostly a secondary source of income. According to Ser-

fling (2019), over 40% of platform workers work less than 10 hours per week and over 60% less than 30 hours per week on platforms; the share of full-time platform workers is just under 40%. However, in the platform worker survey by Baethge et al. (2019), only 20% of online workers and 8% of on location workers spend more than ten hours per week on platform work. Accordingly, the average working time for platform work is 7.5 hours for online and 4.6 hours for on location work. Concerning wages, according to Bonin and Rinne (2017), the share of platform workers who earn their main income from platform work is around 50% for on location work, and significantly lower for online workers. The survey by Baethge et al. (2019) shows much lower values; according to this, only 19% of online and 14% of on location workers earn more than € 800 per month with platform work; a total of 56% use platforms to earn up to an additional € 400 per month. The study by Serfling (2019) also confirms the dominance of additional earnings; according to this study, platform work is the main source of income for only 26% of respondents. In line with these findings, most studies conclude that platform work in Germany is predominantly part-time and marginal employment that complements other forms of income (Pongratz, 2019). According to the study by Serfling (2019), the share of self-employed among platform workers is about 28%, just under 25% define themselves as full-time employees and 5% as part-time employees. The rest of the workforce consists of unemployed (12.6%), retired (18.4%) and students (7%). According to Bonin and Rinne (2017), 56% of platform workers

perform simple tasks, 28% perform tasks that require expertise, and 16% of workers perform both.

Findings on the platforms themselves in Germany are rare. The international project Fairwork evaluated ten platforms in Germany in 2020 (Fairwork, 2021). According to this study all platforms were able to demonstrate paying at least the legal minimum wage; all platforms presented terms and conditions in an easily accessible and transparent manner; seven platforms provided support for fair working conditions in the form of health and safety protection policies; only half of the platforms had orderly procedures for dealing with workers (and only one platform for preventing discrimination against people from disadvantaged backgrounds); and only two platforms complied with the principle of fair codetermination, and no platform provided for a collective worker voice or had evidence to support the formation of a collective worker body.

The challenges and opportunities of work on labour platforms are widely debated among political and social actors in Germany like government entities, parties, associations or other civil society actors. Not surprisingly, the positions in this discourse differ a lot between employers' and business associations, unions, civil society associations and political actors (Greef et al. 2017). Whereas employers' and business associations usually agree that cloud and gig work do not require additional legal measures and that the workers are voluntarily self– employed, trade unions are focussing very much on the necessity to create new regulations to cope with the challenges of gig and cloud work, among them minimum standards to be fulfilled by the platforms concerning transparency and protection, to cover workers and platforms by the legal definitions of employees and the legal concept of the undertaking (which is crucial for the works councils' rights of codetermination, to extend of the rights of works councils by including cloud and gig worker in the scope of codetermination or to cover the workers by the social security systems.

After having observed the developments of the platform work for some years, the German Ministry of Labour (BMAS) finally has made some proposals which are intended to set the framework for further political initiatives and legal regulations (BMAS 2020). Specifically, the BMAS identifies several areas of regulation that should "ensure fair work in the platform economy" and establish a "level-playing-field" in points like: including solo self-employed platform workers in the statutory pension scheme and involving platforms in paying contributions; examining whether and how accident insurance coverage can be improved; opening up the possibility for solo self-employed platform workers to organize themselves and jointly negotiate basic conditions of their activity with the platforms; introducing a shifting of evidence in lawsuits to clarify employee status, thus lowering the inhibition threshold for platform workers to assert their rights in court; or allowing platform workers to take their ratings to another platform, thus limiting dependence on individual platforms.

These points are not intended to initiate national regulation of platform work directly. Instead, the BMAS aims to incorporate the regulatory requirements into the planned EU directive on improving working conditions in platform work (EU 2021). Central points such as the compulsory registration of platforms, the shifting of evidence of employee status, the transparency of algorithms, as well as the information and consultation of workers and their interest groups or the inclusion in social security have found their way into it. It remains to be seen in what form the directive will be implemented and what implementation obligations this will entail for German legislation.

However, despite its still limited size in terms of employment, the gig economy seems to be the area of changes with the most serious impacts on the existing institutions of labour rights and social protection in Germany, also from the view of the trade unions who regard platform work as the avant-garde of a fundamental change of working conditions and labour regulation (Benner 2019). The main reason is that gig work is going along with new forms of employment based on self-employment, which has the effect that workers are not covered by social protection, legal employee rights or labour regulations like collective bargaining. The more popular gig work – either location based or online – becomes and the more it will transform former dependent employees into self-employed gig workers looking for job offers on digital platforms, the more the systems of social security and labour protection might be circumvented and hollowed out (Rahmann and Thelen 2019). However, social institutions like pensions, parental leave benefits or unemployment insurance might also reduce the attractiveness of platform work in Germany and limit its future growth (Funke and Picot 2021; Krzywdzinki and Gerber 2020).

3. German trade unions and works councils – trends and developments

The landscape of German trade unions offers a picture of dynamic change, marked both by processes of erosion and attempts at trade union renewal. Over the past decade or so, German trade unions have developed a number of new approaches to union revitalisation and undertaken a major overhaul of their strategic repertoire. This was triggered by the erosion of the traditional 'dual system' of employee representation in which workplace arrangements based on statutory elected works councils are comple-

mented at industry level by sectoral collective agreements negotiated by trade unions. Coverage of employees by industry-level collective agreements fell from some 70 per cent in the 1990s to below 50 per cent by 2020, with only just under 40 per cent of employees represented by a works council – a drop of some 10 percentage points in recent years. Less than 30 percent of employees work in workplaces that were covered by both a collective agreement and works council representation, the core of the dual system of German industrial relations (Ellguth and Kohaut, 2021). This has been exacerbated by a sharp decline in trade union density, with only about 16 percent of employees now union members compared to more than 30% in the 1980s and early 1990s.

As a consequence, the dual system of industrial relations composed of trade unions negotiating industry collective bargaining agreements and works councils negotiation workplace agreements – with collective bargaining agreements taking priority over workplace agreements according to the favourability principle – no longer shapes the majority of employment relationships in Germany, leading to the parallel existence of three worlds of work (Schröder, 2016): The first consists of Germany's export industry, in which the dual institutions have retained their influence; in a second, these institutions exist but only patchily and employers might informally draw on the provisions set out in industry-level agreements to set their own standards; and in the third, the effect of these institutions is effectively non-existent.

Trade unions have responded to these developments with a range of new strategies, with three approaches taking particular priority: organising initiatives to recruit new members, activating works councils, and fostering participation by both existing members and employees more generally. These elements have been developed to varying degrees by DGB-affiliated unions, and the approach set out below deals with the policies pursued by the metalworkers union IG Metall. IG Metall has set about developing organising into a 'member-orientated offensive' (Wetzel et al., 2013) with two prime aims: first, tackling the 'blank spaces' where there is neither works council nor collective bargaining coverage; and second, engaging with workplaces where these institutions exist formally but where no real union presence on the ground exists. IG Metall has so far made some €170 million available over nine years for organising projects with the aim of making this a routine part of the union's work (IG Metall Bezirk Baden-Württemberg, 2019).

The strategy of activating works councils is mainly focused on workplaces that are within the 'first world' and have both a works council and are covered by collective bargaining. While organising strategies are primarily intended to recruit new members, with improving works councils' capacity to act a secondary consideration, activation projects directly target works councils' capacity to engage in workplace exchanges with management, with recruiting new members a desirable but essentially secondary objective.

Participation is a strategy that extends across a range of issues and projects. For example, member participation has played a key role in generating democratic legitimacy in negotiations during local disputes over derogations from agreed industry standards (Haipeter et al. 2011). Participation has also been a core principle in organising campaigns (Thünken, 2018) and collective bargaining rounds, as with the large-scale employee surveys carried out by IG Metall in 2009, 2013 and 2017 (Bahnmüller and Salm, 2018).

However, in the German system of industrial relations the main actors of employee interest representation on establishment or company level are works councils, which

are elected by all employees working in an establishment and are endowed with legal rights of information, consultation and codetermination. Digitalisation is posing a unique set of challenges for works councils, with recent surveys highlighting a growing need for training to enable works councilors to engage with this issue. IG Metall's 'Transformation Atlas' (IG Metall, 2019) found that more than three-quarters of works councils reported an urgent need for advice and training; only 48 per cent stated that they were provided with early information on change projects; and just 38 per cent said they were included in development and implementation of digital projects.

As yet, the issue of digitalisation has largely been dealt with in workplace-level agreements, concluded by works councils, on issues such as data protection and home or mobile working (Baumann et al., 2018). However, broader agreements on the introduction and the consequences of digitalisation as such are a rarity. There are a number of reasons for this (on the following, see Matuschek and Kleemann, 2018). Digitalisation has an overarching character, touches on a wide range of issues, is difficult to demarcate, and, as a consequence, hard to capture in a set of precise provisions. In addition, works councils – and sometimes also plant or company managements – are not adequately informed about digital technologies and their implications. One factor in this is that digitalisation is often introduced in the form of small projects with decentralised responsibilities, meaning that knowledge is also locally held and not easily accessible from the centre.

However, the existence of workplace agreements on digitalisation depends on the existence of works councils, which is related by law to the existence of establishments as spatial units where workers cooperate and where they can decide jointly to implement a works council, although in reality this might be opposed by management. Platforms, however, do not fulfill this condition as here workers are contracted individually and, at least in the form of on-line cloudwork, do not have any spatial relationships. Therefore, works councils are largely absent in this area and difficult to implement, even if the workers would be willing to do this. Additionally, also trade unions are faced with the challenge to recruit members among platform workers as platforms are not covered by collective bargaining agreements – and trade unions do not produce a visible output for workers – and as the missing common spatial location of the workers makes it extremely difficult to address them.

Given these different challenges for trade unions, the following section will analyse two approaches of the German trade unions to deal with digitalisation which address the two different areas of digitalisation mentioned above: on the one hand 'Industry 4.0' and the problem to support works councils to negotiate workplace agreements, and, on the other hand, platform work and the problem to organise workers and to institutionalise labour relations under new organisational and spatial conditions.

4. Trade unions and 'Industry 4.0'

4.1. The project 'Work 2020' and its goals

How do the trade unions in the manufacturing sector cope with the challenges of 'Industry 4.0'?

This question will be analysed with regard to the trade union project 'Work 2020' that can be considered particularly ambitious and far-reaching. Although it was not

the only project on digitalisation driven by the unions in the sector, it was unique in the volume and forms of support offered from the unions to the works councils. Apart from this, 'Work 2020" was the only common project of several trade unions of the manufacturing sector; it was initiated by IG Metall as the sectoral trade union of the metal and electrical industry jointly with the Chemical Workers' Union (IG BCE) and the Foodworkers' Union (NGG). The project called 'Work 2020' was developed in the region of North Rhine-Westphalia. It is characterised by a combination of new trade union strategies to activate works councils and to make digitalisation and 'Industry 4.0' in the establishments the subject of disputes. The term 'project' is chosen deliberately, because it is based on financial support applied for from the regional government of North– Rhine-Westphalia.

In the project, more than 50 companies of the manufacturing sector were included in several phases, employing almost 100,000 workers, most of them from the metalworking industry as the biggest of the industries involved. The aim of the project was to raise works councils' awareness of the workplace impact of digitalisation, improve their knowledge of the changes, raise their capacity to respond, and, finally, lead to the negotiation of workplace agreements on this issue with employers. The main focus of 'Work 2020' is to provide advice to works councils through a team of full-time union project officers and consultants.

The process envisages a multi-stage procedure for participating workplaces that includes up to 10 days of consultancy advice and should draw in a range of workplace actors. The process begins with a comprehensive assessment of the state of digitalisation at a workplace, culminating in the creation of a 'digitalisation map'. Drawing this up will also involve dialogue with employees, as they are both operational experts and the actors most immediately confronted by technical innovation. The next stage is to identify key political issues with works councils, with the ultimate aim of entering into negotiations with management to conclude workplace agreements setting out how the challenges of digitalisation will be jointly addressed. Thirty plants were included in the project's first phase, with a second phase underway as of summer 2019. This initial phase was supported by a team of researchers, among them the author, in the context of a research project supported by the German Hans-Böckler-Foundation, which tracked 'Work 2020' over a two-year period. The analysis of the project is based on about 30 case studies of the companies that took part in the project. The case studies involved the monitoring of the 'Work 2020' process via the participation of researchers in workshops and expert interviews with works councilors in which they were asked about their assessments of the process and its results and the changes of their own work that went along with it.

4.2. Digitalisation maps and work-related issues

The 'digitalisation maps' have proven to be an important instrument to enable findings on the degree of digitalisation and changes in working conditions in the workplaces included to be depicted graphically. The maps are broken down by the individual departments – like sales, purchasing, maintenance, planning or assembly – of the establishments under scrutiny. They are based on indicators specific to each of these departments, covering two basic dimensions: the level of digitalisation on the one hand and changes at workplaces concerning employment, job requirements, and working conditions.

The findings of the maps in the 30 cases under scrutiny of our project helped to identify problems going along with digitalisation. One important finding was that the number of departments that saw an increase in employment exceeded the number in which employment had fallen in recent years. According to the digitalisation maps, therefore, there was a positive change in employment levels associated with a structural transformation in employment from manufacturing (by operatives) to areas dominated by white-collar employment. Across all departments, there has also been a positive change observed in terms of job requirements. 'Job requirement' in the digitalisation map refers to any improvement or deterioration in the performance of work as a result of changes in required skills or competencies. This does not mean that digitalisation will not have negative effects on workers' skills in the future; the finding is that there has been no discernible deskilling effect up to now and that firms still build on qualified work quite typical for the German production model. By contrast, working conditions have moved in a very different direction. Defined as the sum of several sub– indicators, working conditions were made up of, firstly physical and mental workloads, including job intensification, stress and work strain; secondly, working time autonomy and stress generated by overtime working; and thirdly, ergonomic problems. Leaving these qualifications aside, the message from the workshops was unambiguous: the dominant trend in all the departmental clusters was that working conditions had worsened.

The four most common issues raised in the case-study plants were: employment security, working conditions, training, and, finally, problems of leadership, internal communication and business processes. Securing the future of their plants and employment security were paramount issues for work councils in the project 'Work 2020'. Their greatest concerns, and the biggest current threats to employment, were not related to digitalisation or technology in most instances, however, but lay in their experience of inter-plant competition, the possibility of the relocation of operations, and, in a few cases, serious business problems at their employer.

Working conditions, however, were also influenced by a range of factors, including digitalisation. Of these, the most important in virtually all the sample plants was the very tight approach to staffing adopted by firms as a result of an HR policy driven by the bottom line. This was compounded by the pursuit of a high level of equipment utilization that called for large amounts of overtime working. The main contribution of digitalisation in this area was work intensification, with employees under pressure to resolve software problems or operate numerous poorly integrated systems.

Skills and training also emerged as a major area of works council activity. In some cases, the main focus was on training, in others on continuing training. The workshops also uncovered a number of very basic problems with how further training was planned, with several plants failing to undertake any systematic evaluation of training needs. In some instances, problems were more specific and related to individual areas, and in particular that of digitalisation. Training was seen as especially inadequate when new software was introduced. These deficits were ascribed to cost-cutting strategies of the companies.

While these first three issues are part of the classic repertoire of workplace co-determination, leadership and communication as a fourth issue rather belong to the sphere of 'corporate culture'. As experts in "shaping the software of a workplace" (Kotthoff, 1995: 428), works councils nonetheless have a core responsibility for this area without this customarily being set down in formal agreements. The major el-

ements of this field are the transparency and communication of decisions at both workplace and corporate levels, problems of leadership and management and the lack of employee inclusion, inter-personal problems and concerns about a lack of recognition. Although these are generally not directly linked with digitalisation, they are seen as setting limits on raising the level of digitalisation matched with cooperation and connectivity.

3.3. Workplace agreements

Negotiations on workplace agreements can be seen as a form of 'integrative bargaining' (Walton and McKersie, 1991). In contrast to conventional collective bargaining, they are not about distributive issues, but are positive-sum games offering benefits of cooperation to both negotiating partners. However, such negotiations are hard to plan for as there is no statutory requirement to negotiate them (very different from agreements on establishment level based on the legal framework of the German Work Constitutions Act): they are voluntary for both sides. Workplace agreements of this kind were concluded in seven of the 30 analysed in our research.

What factors favoured the conclusion of such agreements? The most important precondition was an underlying consensus on the part of the parties at workplace level about the mutual benefits of such an agreement. While works councils might hope to gain greater influence over the introduction of digital technologies and the direction of working conditions, managements might have an interest in winning the acceptance and understanding of works councils and employees for digitalisation strategies of the firms or see advantages in including them to help strengthen their operations. In most cases, such an underlying consensus does not come about by chance, but is rooted in a tradition of cooperative industrial relations.

Nonetheless, negotiations call for more than this, and cooperation alone is not enough. The most significant factor militating against the negotiation of such forward-looking agreements was the emergence of supervening conflicts. Although normal in the 'conflictual partnership' that is held to characterise German industrial relations (Müller-Jentsch 1999), in some cases such disputes led to a mixing of different issues and a combination of 'integrative' and 'distributive' bargaining. Staffing cuts, disputes over working hours or derogations from industry-level agreements can swiftly overtake any negotiations on workplace agreements on digitalisation, also providing companies with the opportunity to view cooperation over 'Work 2020' as a service for which they could subsequently extract concessions elsewhere.

The main issues covered by seven workplace agreements negotiated successfully are training and continuing training and, especially, the participation in digitalisation projects which offers the opportunity for works councils to influence the implementation of digital technology from the outset. Further common topics are workforce recognition, working hours, workloads, and data security. However, the main feature of these agreements is that they are essentially procedural in nature. All provided for the establishment of joint working committees with representatives from management and works councils for dealing with the issues and refining them to a point at which it would be possible to agree specific actions. In this sense, the agreements have also generated a fresh imperative for employee representatives as without their active involvement in these processes, no improvements would be possible should problems occur.

Works councils are called upon to be both the drivers and sponsors of the implementation of these agreements. More precisely, the agreements mark the start and not the end of the process by which works councils can shape how digitalisation proceeds at their workplaces. This then raises the question as to what happens once such an agreement has been concluded. Given the limited time-frame of our research, it was not possible to arrive at any systematic findings on this issue. Nonetheless, some information was gleaned from interviews with works councilors, revealing a wide range of practice. On the one hand, there were cases in which the agreements opened up new issues and areas for activity and were used also to undertake a fundamental restructuring of how the works council operated. In these cases, joint working parties were established and works councils were active in pursuing the new topics. In one case, the works council even reassigned its entire operations and dissolved its previous committees, most of which had only ever existed on paper. On the other hand, there were instances where the opportunities offered by the agreement had not been made use of nor could be made use of. One conclusion from this variance is that concluding such an agreement does not automatically equate to the activation of the works council. Rather, works councils need to acquire the habit.

3.4. Participation and trade unions

The way the process of 'Work 2020' worked in the establishments rested not only on the initial conditions in terms of workplace industrial relations but also on two other factors: employee participation and close cooperation between works councils and trade unions. Employee participation was significant – in fact, indispensable – for two reasons: first, it opened up a route to expert knowledge in areas in which works councils could not call on this from within their own ranks as it related to departments that were unrepresented in the works councils'committees; and secondly it created contacts, interests and legitimation for 'Work 2020' and the process of interest representation overall. How this took place differed considerably as between workplaces in the project. In most cases, employees were drawn on selectively to make up for any shortfalls of knowledge within the works council. This was especially so for departments that had traditionally kept their distance from the works council, which were not represented on it, and, conversely, which works councils had done little to cultivate. This situation led to a genuine learning effect, e.g. in the form of additional interviews that were conducted with employees from different areas, widening the 'empirical bases' of the process of creating the digitalisation map. In addition, this also raised the significance of the maps to management as they were an expression of broad employee knowledge. Participation was also used strategically as a power resource for employee representation in other instances, for example in forms of departmental meetings or surveys.

The trade unions had difficulties to be perceived as initiators of the project as the communication with the employees largely was organised along the communication channels of the works councils; trade unions use to have their own representation bodies only in bigger establishments. However, there were case-study plants in which 'Work 2020' was positioned by the works councils from the start as a trade union project. In these cases, the project was viewed and implemented as means for mutually strengthening both facets of employee representation, although, as yet, there have been no major organisational breakthroughs, except one case where the

trade union membership rose from 30 to 50 per cent of the workforce. As far as the works council was concerned, the project led to a fresh image of IG Metall as an influential force at workplace level with an enduring rather than short-term impact. This might well be attractive to employees who expect a trade union to be more than simply a party to industry-level collective bargaining but rather an organisation that engages with the details of workplace issues. And although 'Work 2020' is not an organising project in the narrow sense of the term but is aimed at improving the capacity of works councils, this in itself holds out the prospect for trade organising given that classic organising approaches do not concern themselves with issues of influencing and shaping workplace developments.

4. Gig Work

Whereas the attempts to cope with 'Industry 4.0' by the trade unions take place mainly in the first world of the institutionalised dual system with sectoral collective bargaining and works councils, trade union and employee initiatives in platform work – both in the sense of location– based and on-line work – take place in the Third World of non-institutionalised or liberalised labour relations. They are about institution building, not about institution improving, like the 'Work 2020" project.

Current research on labour relations in the platform economy has focused on delivery service platforms, which became the center of social conflicts over working conditions and the establishment of interest representation on platforms. An online survey of 246 riders revealed that 61% of them have contact with other riders, that 70% are only inadequately informed about innovations in work processes by the platforms, that 63% of riders feel at the mercy of digital technology, that around 60% do not identify with their work, and that their income is only good enough to live on for just under 30% of respondents (Heiland 2019). Also in an international perspective, labor conflicts and the grass roots organization of employees are mainly concentrated in the food delivery sector; worldwide, more than 500 labor conflicts can be counted in this industry for the period 2017 to 2020, of which about 50% took place in Europe. The four most important conflict topics were pay (in over 63% of cases), employment status (more than 23%), working conditions (around 20%) and health and safety (just over 17%) (Trappmann et al. 2020).

However, initiatives of trade unions and grass-roots campaigns of employees to organize and to institutionalise worker representatives are even more diverse and either try to influence the ways platforms treat workers and working conditions or to establish formal institutions of employee representation for platform workers. Three of these initiatives will be analysed subsequently, one of them the first big grassroots campaign from the food delivery sector and two of them the most developed top-down approaches by the German trade unions, one of the service sector union Ver.di and one of the IG Metall. The analysis is based both on secondary sources and on own research based on interviews with union representatives and workers active in labour disputes.

4.1. Fair Crowd Work

Probably the most elaborate trade union initiative to spread advocacy structures in the platform economy is IG Metall's Fair Crowd Work initiative, which started in

2015. Shortly before, the current Second Chair of the union, Christiane Benner, had published a book entitled "Crowdwork – Back to the Future?" (Benner 2014). This book opened and shaped the trade union debate on crowdwork. In the book, the editor gives three reasons why trade unions should engage with crowdwork: Because working in the online world will have an impact on the working conditions of all workers; because online work is work that should be fairly paid and regulated; and because it is important to prevent a social regression that could throw society back to the beginning of the industrial age. She demanded that protective rights of economic life, such as copyrights and general terms and conditions, must apply to crowdworkers, that protective rights for employees must apply to crowdworkers or be extended to that effect, and that digital work must be legally designed in order to be able to enforce minimum conditions. This is explicitly not about preventing digital work, but about its social regulation.

At the same time, the union developed a first version of a website called "Fair Crowd Work" and put it online. In doing so, it tied in with the browser plug-in "Turkopticon", which was developed as a counter-movement to the "Amazon Turk" platform (cf. Silberman/Irani 2016; Ellmer 2016) and on which crowdworkers can rate their clients with the long-term goal of establishing a "Workers' Bill of Rights". One of the masterminds behind "Turkopticon", M. Six Silberman, moved to IG Metall a short time later and took over the supervision of the 'Fair Crowd Work' platform. In the same year, the concept of the website was revised and a second version of the site was launched a year later. The crucial change was to change the method of the survey. In the first version, the rating was given directly by the visitors. The only prerequisite was to register on the website with an email address; there was no secure information about whether the raters had actually ever worked on a platform. This procedure no longer seemed legally secure enough. The background for this assumption was the court action of a dentist who had sued against a rating of his practice on the net with the argument that he had never treated or even seen the rater who gave him a bad rating. The court ruled in favour of the plaintiff in this case, and the rating had to be deleted.

Therefore, a new approach was developed in the second version, namely a survey of employees on platforms. Platforms were approached for this, as long as the questionnaires could not be set there from the outside, and most of the platforms – except for platforms known to be critical of trade unions, such as Amazon and Uber – also agreed. IG Metall decided to pay the respondents for this survey. On the one hand, this was to ensure a good response rate, and on the other hand, it was to take into account the nature of crowdwork to earn money with clicks. The questionnaires were then evaluated by IG Metall and also subjected to a consistency test, only then were the rankings processed. The number of questionnaires received had a range of 25 to 150 per platform. The survey was not representative, but it provided results that did not exist elsewhere.

The platforms' unexpected willingness to engage in dialogue provided the impetus to expand the dialogue. IG Metall decided to put a second pillar of the trade union strategy alongside the rating platform and the survey, namely to develop direct influence on the behaviour of the platforms. An important starting point for this was the 'Code of Conduct for Platforms', which had been agreed by some platforms in Germany in 2015 in order to improve the platforms' bad public reputation. According to the preamble, the Code of Conduct, which has since been signed by eight plat-

forms in a second version, aims "to establish generally applicable guidelines for their own actions in the context of paid crowd work, in addition to legislation, and thus to create a basis for trusting and fair cooperation between platform operators and crowd workers." It contains points such as conformity with legal requirements, fair – especially transparent – payment, good work, respectful interaction, clear targets and reasonable scheduling, constructive feedback, a regulated evaluation process and compliance with data protection law and privacy for workers.

In the run-up to the discussion with the platforms, IG Metall held a workshop in Frankfurt together with international trade unions from Austria, Sweden, Denmark as well as the USA and Canada and subsequently published the "Frankfurt Declaration" (IG Metall et al. 2016), in which the trade unions pleaded for compliance with the minimum wage, access to social security transparency and arbitration procedures. With these points, IG Metall entered into discussions with representatives of the platforms that have signed the Code of Conduct. In particular, it emphasised the role of the minimum wage. Platforms have pointed to two problems: the difficulty of measuring working time and global competition for contracts. A first step of collaboration between the platforms and the trade union was to revise the Code of Conduct. The principle that the platforms pay according to local rates was introduced. This did not correspond to the demand for compliance with the minimum wage but was seen by IG Metall as an important first step. The revised version of the Code of Conduct was presented in 2017 and signed by five more platforms compared to the first version. A second important step was also taken in 2017 when IG Metall, together with the now eight signatories of the Code of Conduct and the German Crowdsourcing Association (DCV), set up an Ombuds Office to ensure the implementation of the standards of the Code of Conduct and to deal with conflicts

between crowdworkers and platforms. The Ombuds Office is staffed by five people, including two representatives of the platforms (one platform and the DCV), two representatives of the workers (one crowdworker and one trade union representative) and, as a neutral person, a labour judge. Since the opening of the ombudsman's office, around 30 proceedings have been dealt with; all proceedings were resolved by consensus with the involvement of the ombudsman's office.

Since then, the IG Metall pursued three further focal points in its crowdworking initiative. The first focus is the expansion of the signatory list of the Code of Conduct; the union is talking to other platforms, also from the area of gig working, and trying to convince them to sign the Code. The second focus is the development of a third version of the Fair Crowd Work platform, with the aim of developing a catalogue of criteria for a good design of the General Terms and Conditions (FAQ) and posting it there. Because, from the union's point of view, it is not only the status of the employees that is decided with the FAQs, but also the working conditions with regard to transparency and fair treatment and communication.

The third focus is membership recruitment. It is true that IG Metall has addressed many crowd-workers and also achieved a few hundred trade union memberships. This is not a large number in absolute terms; however, in view of the lack of establishment structures and a collective representation of interests by works councils – membership recruitment is the traditional core business of works councils – the successes should not be underestimated. Nevertheless, the approach and recruitment of members is to be systematised. This, too, is to be set up on the new platform. At the same time, advertising on social media channels is to be intensified.

4.2. Advice for self-employed

In the service sector trade union Ver.di, after the IG Metall the second biggest trade union in Germany, the starting point for dealing with crowdwork was the debate on internal crowdsourcing and Generation Open at IBM, which took place around 2012 (cf. Boes et al., 2014). IBM had for the first time set up a platform on which internal employees could compete with each other and with external competitors for projects. Ver.di wrote a "Berlin crowdsourcing cloudworking paper" on this (Ver.di 2012), which emphasised the protection of the interests of users and employees in the digital transformation and as a basis for innovation policy. Then little happened for a while until the union decided to collaborate with sociologists from the ISF Munich and the University of Kassel on a project on crowdworking funded by the Federal Ministry of Education and Research (BMBF). From the trade union's point of view, the aim was to develop recommendations for works councils on how to deal with crowdwork. This proved to be difficult, however, because there was no information on the extent of the phenomenon, where in the broad organisational area of the trade union it occurs and for whom it is a problem at all.

Therefore, a survey was first conducted among works councils and trade union members. The survey showed that many works councils were still not very familiar with the concept of platforms, and more often equated them with social media. Therefore, the union saw a central task in sensitising works councils to the topic as a potentially important future field; however, without dramatising it, because the survey also showed that the spread of full-time crowdworking is still low (cf. Pongratz/ Bormann 2017).

Another result of the survey was that the selection of jobs is an important issue for crowdworkers and that there is a great need for advice. Therefore, the union decided to organise a counselling service through its department for self-employed workers. This unit is part of the union's media department and has traditionally taken care of journalists who often work as self-employed for publishing houses, newspapers and magazines. There was therefore both a technical expertise in questions of self-employment and a high sensitivity for the issue. The unit has been serving not only journalists for a long time, but also other groups of self-employed people. The unit's connectivity to the new question was also high; it had already developed a sophisticated offer on the internet, including a fee database, and a self-employed portal was also managed there. In terms of content, the counselling relates to fee, sector, social security or contract issues, but legal advice is also provided. The counselling is free of charge for trade union members.

The self-employed unit is an independent organisational unit within the trade union organisation with its own budget. It currently looks after about 30,000 self-employed people who are members of the union. When it comes to organising, the trade union also has to deal with the question of costs and returns. This is especially true for crowdwork, whose quantitative importance has obviously been overestimated rather than underestimated, especially with regard to employees who earn their main income on platforms. In the expert's view, online workers are less numerous than offline platform workers, for example in the health sector, and they are more difficult to reach and thus to organise.

Irrespective of this, Ver.di, similar to IG Metall, is also trying to enter into talks with the platforms in order to be able to exert influence on working conditions in

this way. The goal of concluding company agreements with platforms is still a long way off. There are no real negotiations yet. Nevertheless, talks are being held with at least some platforms that are based in Germany, which are open to talking to the union. Issues here are the exchange of information, the question of possible common goals, and also the question of how and whether more binding regulations on working conditions are possible.

4.3. Establishing works councils

The third initiative is an example of the conflicts about the establishment of a works council in food delivery services. In the last decade, a wide network of such services has developed in German urban areas, offered by multinationals such as Foodora, Lieferando or Deliveroo. Initiatives to establish works councils took place in several companies in the sector; the focus here is on the development at Deliveroo, a company based in London (UK) that also operated in Germany, among other places. Here, the initiators of the works council formation launched an extremely successful media campaign entitled "Deliveroo at the limit", in which they scandalised the working conditions at the delivery services and made them known to a broad public. Different from the initiatives described before, the establishment of works councils has its origins in grassroots activities of workers.

Online food delivery services supply customers with drinks and food prepared in partner restaurants. The organisation of work in this process is "almost completely digitised" (Palmer 2017, p. 29). The work orders to the drivers, also called 'riders', are distributed by means of an algorithm: Incoming orders are accepted, then the algorithm locates the next available driver and sends him the order. At Deliveroo, at the time of the initiative's launch, the majority of employees were on fixed-term contracts of six months. In addition, there were – fewer – freelancers who worked as solo self-employed on a contract basis. The freelancers were paid per ride, the employees received a fixed hourly rate. The riders themselves are provided with a backpack, rain jacket, rain trousers and T-shirts, the rest of the equipment they have to provide themselves. This applies in particular to a smartphone and data plan, which are indispensable for carrying out the activities, as well as a bicycle. However, the main problem for the workers at Deliveroo was that the payslips were wrong or incomplete for many workers, and this mostly to the disadvantage of the workers. This was perceived as unfair by the workers and eventually led to the establishment of a works council.

The city of Cologne became the centre of activity. In summer 2017, a works council had already been founded at a competitor company, Foodora. From there, some activists moved to Deliveroo and were initially surprised to find similar problems there as at their old employer. They decided to initiate the establishment of a works council and asked the union of the food and restaurant workers (NGG) for help. This proved to be a rocky process, which was demonstrated by two decisions taken by the company after the initiators announced that they wanted to establish a works council. The first concerned the company's social media platform. This platform enabled communication both with other workers at the Cologne site and, on a second channel, with workers throughout Germany. In September 2017, the initiators sent out information via the Germany-wide network that they wanted to set up an election committee for a works council in Cologne. Less than an hour later, the

company shut down the platform. Communication between workers via company channels has since only been possible via the company's headquarters in Berlin.

The second decision concerned the initiators themselves. When they officially announced the formation of an election committee to the company, the main initiator, the later works council chair, was demoted in the organisation. Besides being a rider, he also acted as a mentor, advising and supervising the riders in the office. After the announcement, he was banned from entering the office any further; he was only allowed to deliver orders. In doing so, the company exploited a regulatory weakness in the German Works Constitution Act. While the law protects election committees from dismissal or other discrimination, there is little legal protection during the run-up to the election.

Finally, about 30 people out of about 200 employees at the site took part in the election and voted for the new works council. Alternative communication channels had to be made available for pre– and post-election information, as communication via the company's social media platforms was blocked. Alternatively, two WhatsApp groups were set up among the drivers. One of them was only used to make appointments for the end of the working day. The other was the forum for criticism. Thanks to the communication of this group, the knowledge about the many billing errors was spread. Here the drivers also learned about experiences from legal proceedings of riders which were supported by the trade union NGG.

Immediately after the election, the company began to replace employees with freelancers. Expiring fixed-term contracts were not renewed, but orders were increasingly given to freelancers. In November 2017, there were about 140 salaried riders, in February 2018 only about 20. "Within three months, the company let more than half of the 100 fixed-term contracts at the Cologne site expire" (Zander 2018, p. 17).

The works council first tried to get information and data from the company on employment relationships and pay. In this way, it wanted to explore its co-determination possibilities in the organisation of employment relationships. In the course of the works council election and the numerous obstructions, the initiators also came up with the idea of going public with the problems. They developed a poster with the slogan 'Delivering at the limits'. The poster was used to organise a flash mob on a square in the centre of Cologne. In fact, it was more of a demonstration. The action was very effective in terms of advertising; newspapers as well as radio and public television were on site. Drivers from the competitor Foodora also came and joined the demonstrators. A spiral of growing interest then unfolded, leading the initiators all the way to the Federal Minister of Labour who talked to them in a political show on TV. The initiators also set up a page on Facebook about 'Delivering at the limits'. The aim was to make public what happens at the food delivery companies. Requests for interviews and invitations to conferences and talk shows also testify to an unbroken interest in the topic.

'Delivering at the limit' was an initiative of the drivers. But the trade union Nahrung-Genuss– Gaststätten (NGG) played an important supporting role in the process. It advised the initiators in setting up the works council, and it helped to finetune the concept for public relations work, and strategy meetings were held in the union's offices on how to continue the campaign. The union also advised on press relations, which have become increasingly burdensome. A member of Deliveroo's original works council has moved to the union and is now project secretary for the

delivery services. In this way the initiative was adopted by the trade union NGG as an official trade union campaign.

Although the labour disputes in food delivery services in Germany mostly have a local focus and are initiated by local platform workers' initiatives, some of the newer disputes about fair working conditions received nationwide public attention, most important among them the labour conflict at the platform 'Gorillas' which shows many similarities to the Deliveroo case. Also, here the poor working conditions at the platform became an issue of public attention. After a rider was unlawfully dismissed from the point of view of other platform workers, a first (wildcat) strike took place (Ewen et al., 2022). The delivery warehouses of the platform were blocked in Berlin. In the further development of the conflict, the platform company has dismissed riders who were involved in the strike. In the meantime, an attempt has been made – with the support of Ver.di – to install a works council at Gorillas (Gross, 2021). The platform tried to prevent the formation of a works council, using legal and other union busting methods. This was probably one of the reasons for the relocation of the headquarters from Berlin to the Netherlands (Holst et al., 2022).

5. Conclusions

The initiatives analysed here show, on the one hand, the broad spectrum of challenges associated with digitalisation for German trade unions. At the same time, they give an impression of the variety of trade union responses. While the digitalisation of industrial production according to the model of 'Industry 4.0' has so far been characterised by incremental technological changes and the trade unions can base their strategies here on established structures of interest representation, work platforms are accompanied by a disruptive change in employment relationships and the trade unions must first establish themselves as a representation of employees' interests. Institution building in the area of platform work is further complicated by the fact that here no establishments in the sense of spatially structured cooperation of employees exist which could be the location for the implementation of works councils and for addressing workers by trade unions. However, work on the food delivery platforms differs from this general analysis as it is spatially much more concentrated and the platforms have local offices which can be used as locations of campaigns and demands; therefore, it is not surprising that grass-roots activities of workers have started here. Given these differences, both areas have one thing in common: the trade unions are trying to influence digitalisation and its consequences for workers and working conditions with their own initiatives, and to reposition themselves as interest representation bodies in the process. However, these initiatives also have their own particular limits.

In the manufacturing sector, trade unions tried to develop new strategies that include projects to activate works councils. 'Work 2020' is a notable example, with its elements of mapping digitalisation, working up new policy areas, and efforts to conclude agreements to extend works councils' scope to influence how changes are developed and implemented. In this context, digitalisation maps drawn up at departmental level have proved to be an important instrument for creating transparency over how digitalisation is proceeding in practice at workplace level and the challenges this poses, creating a foundation on which works councils can acquire

knowledge that can be directly deployed as a power resource and a guide to action. Establishment agreements, in line with current processes of digitalisation, are procedural in nature. They formulate opportunities – or better requirements – for action and participation on the part of works councils, some of which were already being put into practice in the case-study plants. One prerequisite for this is that works councils adopt a strategic perspective towards the issues and objectives explored in the project.

The analysis of the project also shows that the dual character of German industrial relations – cooperation between works councils and trade unions at workplace level – will play an increasingly important role in responding to the current challenges and transformations and serve as the foundation for revitalising employee representation. For German trade unions from the manufacturing sector this means developing their workplace activities and, where possible, linking the activation of works councils with steps to strengthen their own workplace organisational power. 'Work 2020' offers a very promising means for this. However, there are also limits to this strategy. A first limit is that projects like 'Work 2020' have limited resources so that only a limited number of workplaces can be included; their effectiveness, therefore, also depends on the ability to form a model which works councils and the trade union secretaries not included in the project directly might try to apply on their own. A second limit is that the instruments of the project can be used only in areas that already have works councils. In the many workplaces without works councils the trade unions face a much more demanding task as they have to create works councils by using organising strategies to win the first place. In this sense, trade union organising and the activation of works councils should be seen as complementary strategies in the overall repertoire of trade unions.

The initiatives in the field of platform work show that the platform logic does not prevent the emergence of common worker concerns. Although the main responsibility for shaping and regulating cloud and gig work is often seen by trade unions as lying primarily with political frameworks for regulating solo self-employment, the initiatives presented here do not rely on this; and one could say that the need for reforms is made clear precisely by these initiatives. This includes the question of legal protection for temporary works councils as well as the protection of initiators in works council elections prior to the election of the electoral body or the question of the operational form of platform work.

The initiatives are both bottom-up and top-down. The bottom-up initiative 'Delivering at the Limit' of the riders benefited from the location-dependency of food delivery services. The bike couriers could meet each other during their work as well as during breaks or on the way to/from the start of their shift, and could also recognise each other by their clothes. This suggests that direct communication and immediate exchange – i.e. face-to-face conversation – remain important for the development of solidarity-based expressions of interest even in digitally coordinated work. However, these initiatives are facing a hard opposition by the platforms who do not want workers' representatives to be institutionalised and who do not want to join the trade unions in collective bargaining.

In the area of cloudworking, the lack of co-presence of workers stands in the way of any bottom-up initiatives. However, such initiatives gain incomparably more weight if they receive organisational support from established interest representation organisations. The prerequisite for such a commitment is, of course, that in weighing

up the effort and return of such initiatives, the trade unions come to the conclusion that such interventions could be important investments for their future. The checkered history of the self-employed advisory service of the trade union Ver.di suggests that it is not always easy to reach an understanding on this; the high resource input with uncertain prospects of strengthening organisational power represents the most severe limit for trade union initiatives in the platform economy. However, if one assumes that the development of the platform economy can have spill-over effects into traditional areas of gainful employment in the future, then the initiatives under consideration take on a significance beyond their specific concerns.

The initiatives analysed in this paper are located on a national or regional level only, although many of the challenges they deal with are of a transnational character. 'Industry 4.0', however it will look like in the end, will become part of global production systems and value chains within the manufacturing sector in many countries, and many labour platforms – both in gig– and cloud working like in the food delivery sector or in microtasks of online work – operate on an international or even global base. Therefore, one might expect transnational answers by transnational trade union initiatives to grow which deal with the transnational dimensions of the challenges like a transnational campaign coordinated by European or global trade union federations on certain platforms, scandalising wage levels or working conditions. Indeed, this is still missing, although the grass root initiatives in the food delivery sector have taken place in many countries and might have served as models amongst each other (Trappmann et al. 2020). At the same time, there are opportunities to deal with the issue of digitalisation on a transnational level, which might be less publicity-boosting but not necessarily less effective. In the manufacturing sector, transnational answers on digitalisation can be developed in institutionalised bodies like the European Works Councils where employee representatives can develop transnational strategies on how to deal with new technologies. These institutionalised opportunities do not exist for work on labour platforms in the first place, but here the development of a directive on platform work by the European Commission has opened a window of opportunity for the European Trade Union Confederation to influence the political process. Beyond such transnational strategies of trade unions, however, the institutionalisation of labour relations in this area will have to start on the local level by implementing works councils and then on the company or sectoral level by implementing collective bargaining, which seems to be still a long way to go for the trade unions.

7. Bibliographic references

Ahlers, E. (2018). Die Digitalisierung der Work. Verbreitung und Einschätzung der Betriebsräte. WSI– Report No. 40, Düsseldorf: Hans-Böckler-Stiftung.

Arbeitskreis Industrie 4.0 (2012). Umsetzungsempfehlungen für das Zukunftsprojekt Industrie 4.0., Berlin.

Baethge, C. B., Boberach, M., Hoffmann, H. and Wintermann, O. (2019). Plattformarbeit in Deutschland. Freie und flexible Arbeit ohne soziale Sicherung, Bertelsmann Stiftung, Kantar.

Bahnmüller, R. and R. Salm (2018). Beteiligung und Tarifpolitik: Debatten, Ansätze und Grenzen am Beispiel der IG Metall. Industrielle Beziehungen. Vol 25. No. 1, 27-50.

Baumann, H., Mierich, S. and M. Maschke, M. (2018). Betriebsvereinbarungen 2017 – Verbreitung und (Trend-)Themen, WSI-Mitteilungen, Vo. 71. No 4, 317-325.

Benner, C. (Hrsg.) (2019). Crowdwork – Zürück in die Zukunft? Perspektiven digitaler Work. Frankfurt: Bund-Verlag.

Bertschek, I., Ohnemus, and J. Viete, S. (2016). Befragung zum sozioökonomischen Hintergrund und zu den Motiven von Crowdworkern. Endbericht zur Kurzexpertise. Berlin.

Boes, A., Kämpf, T., Langes, B., Lühr and T. Steglich, S. (2014). Cloudworking und die Zukunft der Arbeit: Kritische Analysen am Beispiel der Strategie "Generation Open" von IBM. Unter: https://innovation-gute-Arbeit.verdi.de/++file++560d2825aa698e7a69000387/download/IBM– Gutachten_E-Mail.pdf

BMAS (2020). Eckpunkte des BMAS: Faire Work in der Plattformökonomie. https://www.bmas.de/SharedDocs/Downloads/DE/Pressemitteilungen/2020/eckpunkte-faire–plattformWork.pdf

Bonin, H. and Rinne, U. (2017). Omnibusbefragung zur Verbesserung der Datenlage neuer Beschäftigungsformen, IZA Research Report Series No. 80.

Ellmer, M. (2016). "Ich geb' dir eine Review, Große/r!": Amazon Mechanical Turk, Turkopticon und Solidarität in transnationalen, digitalen Arbeitsräumen. Kurswechsel No. 2, 51–62.

Ellguth, P. and S. Kohaut (2021). Tarifbindung und betriebliche Interessenvertretung. Ergebnisse aus dem IAB-Betriebspanel 2020. WSI-Mitteilungen Vol. 72. No. 4, 290-297.

Ewen, J., Heiland, H., and Seeliger, M. (2022). *Dynamiken autonomer Arbeitskonflikte im digitalen Kapitalismus: Der Fall "Gorillas",* Schriftenreihe Institut Arbeit und Wirtschaft, no. 33, Bremen.

EU (2021). Proposal for a Directive om Improving Working Conditions in Platform Work.

Fairwork (2021): Fairwork Jahresbericht 2020. https://fair.work/wp-content/uploads/sites/131/2021/02/Fairwork-2020-Annual-Report_German.pd

Falkenberg, J. (2021). Taylors Agenten. Eine arbeitssoziologische Analyse mobiler Assistenzsysteme in der Logistik. Baden-Baden: Nomos.

Funke, C. and Picot, G. (2021). Platform Work in a Coordinated Market Economy. *Industrial Relations Journal* 52, 348-363.

Gerst, D. (2019). Autonome Systeme und Künstliche Intelligenz. Herausforderungen für die Arbeitssystemgestaltung. Hirsch-Kreinsen, H. and Karacic, A. (eds.), Autonome Systeme und Work. Perspektiven, Herausforderungen und Grenzen der Künstlichen Intelligenz in der Arbeitswelt. Bielefeld: Transcript, 101-137.

Gerst, D. (2016). Roboter erobern die Arbeitswelt. in: Schröder, L. and H.-J. Urban (eds.), Gute Work. Digitale Arbeitswelt – Trends und Anforderungen. Frankfurt: Bund Verlag 279-293.

Greef, S. et al. (2017). Plattformökonomie und Crowdworking: eine zentrale Analyse der Strategien und Positionen zentraler Akteure. Forschungsbericht für das Bundesministerium für Arbeit und Soziales. Berlin.

Gross, S. (2021). Wie im Wilden Westen. *Süddeutsche Zeitung* (Nord), 23/11/2021, p. 17.

Haipeter, T. (2016). The Interests of White-Collar Workers and their Representation in the German Manufacturing Sector: new initiatives, opportunity structures, framing and resources. In: Industrial relations journal 47 (4), 304–321

Haipeter, T., Brettschneider, A., Bromberg, T. and S. Lehndorff (2011). Rückenwind für die Betriebsräte: Eine Analyse betrieblicher Modernisierungskampagnen in der Metall– und Elektroindustrie. Berlin: Sigma.

Harmon, E. and Silberman, M. S. (2018). Rating Working Conditions on Digital Labor Platforms, Computer Supported Cooperative Work (CSCW), vol. 27(3-6), pp. 1275-1324.

Heiland, H. (2019): Plattformarbeit im Fokus. Ergebnisse einer explorativen Online-Umfrage zu plattformvermittelter Kurzarbeit. *WSI-Mitteilungen* 72 (4), 298-304.

Hirsch-Kreinsen, H. (2022). Soziale Dynamik der künstlichen Intelligenz. ZU Dortmund / SFS Beiträge aus der Forschung 209. Dortmund.

Holst, J., Klug, D., and Stockburger, M. (2022). Gorillas legt Zwischenstopp in Frankfurt ein. *Lebensmittel Zeitung*, vol. *74, no.* 4, p. 10, available at: https://doi.org/10.51202/0947-7527-2022-4– 010

Hünefeld, L. et al. (2021). Digitalization and Employment: Working via Online-Platforms. Corunka, C. (ed.), Flexible Working Practices and Approaches. Berlin: Springer, 167-190.

IG Metall (2019). 'Transformationsatlas: Wesentliche Ergebnisse '. unpublished.

IG Metall Bezirk Baden-Württemberg (ed.) (2018). aufrecht gehen. Wie Beschäftigte durch Organizing zu ihrem Recht kommen. Hamburg.

IGMetalletal.(2016).FrankfurterErklärung.https://www.igmetall.de/dl/igm/20161214_Frankfurt_Paper_on_Platform_Based_Work_EN_b939ef89 f7e5f3a639cd6a1a930feffd8f55cecb.pdf?

Kotthoff, H. (1995). 'Betriebsräte und betriebliche Reorganisation. Zur Modernisierung eines "alten Hasen"', Work 4 (4), 425-447.

Krzywdzinski, M., Pfeiffer, S., Evers, M. and Gerber, C. (2022). Measuring Work and Workers. Wearables and Digital Assistance Systems in Manufacturing and Logistics. WZB Discussion Paper SP III 2022-301. Berlin: WZB.

Krzywdzinski, M. and Gerber, C. (2020). Varieties of Platform Work: Platforms and Social Inequality in Germany and the United States. Weizenbaum Series 7, Berlin.

Kuhlmann, M. (2018). 'Montagearbeit 4.0? Eine Fallstudie zu Arbeitswirkungen und Gestaltungsperspektiven digitaler Werkerführung', WSI-Mitteilungen 71 (3), 182-188.

Lins, D. et al. (2018). Industrie 4.0 – Mitbestimmen – Mitgestalten. FGW-Studie Digitalisierung von Work 06. Düsseldorf.

Matuschek, I. and Kleemann, F. (2018). 'Was man nicht kennt, kann man nicht regeln. Betriebsvereinbarungen als Instrument der Arbeitspolitischen Regulierung von Industrie 4.0 und Digitalisierung', WSI-Mitteilungen 71 (3), 227-234.

Müller-Jentsch, W. (1999).: Konfliktpartnerschaft. Akteure und Institutionen industrieller Beziehungen. München und Mering: Hampp.

Niehaus, J. (2017). Mobile Assistenzsysteme für Industrie 4.0: Gestaltungsoptionen zwischen Autonomie und Kontrolle. FGW-Studie Digitalisierung von Arbeit. Düsseldorf.

Palmer, Georgia 2017, Foodora & Co.: Die Revolte der neuen Dienstbotenklasse. In: Blätter für deutsche und internationale Politik (7), S. 29-32.

Pongratz, H. J. (2019). Online-Arbeit als Nebenverdienst, in: Boes, A., Langes, B. (Eds.), Die Cloud und der digitale Umbruch in Wirtschaft und Arbeit: Strategien, Best-Practices und Gestaltungsimpulse, pp. 191–205.

Pongratz, Hans / Bormann, Sarah (2017). Online-Arbeit auf Internet-Plattformen. Empirische Befunde zum Crowdworking in Germany. In: AIS Studien 10 (2): 158-181.

Rahmann, K.S., and Thelen, K. (2019). The Rise of the Platform Business Model and the Transformation of Twenty-First-Century Capitalism. Politics and Society 47 (2), 177-204.

Schroeder, W. and Fuchs, S. (2019). Neue Mitglieder für die Gewerkschaften. Mitgliederpolitik als neues Politikgeld der Gewerkschaften. OBS-Arbeitsheft 97. Frankfurt.

Schroeder, W. (2016). 'Konfliktpartnerschaft – still alive. Veränderter Konfliktmodus in der verarbeitenden Industrie', Industrielle Beziehungen, 23 (3), 374-392.

Serfling, O. (2019). Crowdworking-Monitor Nr. 2. Discussion Papers in Behavioural Sciences and Economics, no. 5. Hochschule Rhein-Waal.

Silberman, M. Six / Irani, Lilly (2016), Operation an employer reputation system: Lessons from turkopticon, 2008-2015. In: Comparative Labor Law & Policy Journal 37 (3), pp. 505-542.

Thünken, O. (2018). 'Bewegung im Betrieb. Organizing-Projekte und die Revitalisierung der industriellen Beziehungen,', Industrielle Beziehungen, 25 (2), 231-251.

Trappmann, V. et al. (2020). Global Unrest on Labour Platforms. The Case of Food Delivery Workers, Berlin: Friedrich-Ebert-Stiftung.

Ver.di (2012). Crowdsourcing und Cloudworking: Gefahren für Gesellschaft und Arbeitnehmerinnen und Arbeitnehmer: Berliner Crowdsourcing-Cloudworking-Papier. Unter: https://innovation-gute-Arbeit.verdi.de/++file++557583e5aa698e5a58000e47/download/verdi-Positionspapier_Cloudworking-Crowdsourcing.pdf

Walton, R.E. and McKersie, R.E. (1991). A Behavioral Theory of Labor Negotiations. An Analysis of Social Interaction Systems. (Reprint von 1965). Ithaca.

Wetzel, D. (2013). 'Für eine neue gewerkschaftliche Agenda' in Wetzel, D. (eds) Organizing. Die Veränderungen der gewerkschaftlichen Praxis durch das Prinzip Beteiligung. Hamburg. pp. 3-29.

Zander, Ingo (2018). Naturtalent der Mitbestimmung. In: MITBESTIMMUNG (07). Unter: https://www.magazin-mitbestimmung.de/artikel/Naturtalent+der+Mitbestimmung@6903