

A decorative graphic consisting of a grid of grey dots of varying sizes, with several dots highlighted in red. The dots are arranged in a pattern that roughly outlines the shape of a map of Europe.

Shaping Digitalisation

Industry 4.0 – Work 4.0 – Regulation of the Platform Economy

WOLFGANG SCHROEDER / SAMUEL GREEF / BENEDIKT SCHREITER

November 2017

- Digitalisation has proven to be a global megatrend with immense consequences for politics, the economy and society. Technological change including high-performance IT systems, new network infrastructures, robotics, algorithms and artificial intelligence pose new challenges on industry, labour market and social as well as technology policy. Due to these innovations, there is considerable potential for rationalisation and automatisisation of jobs, but also for social innovations.
- The strategic approaches to digitalisation in different national economies depend on institutional conditions, traditions and power relations. Here, the German model based on social partnership and corporatism is of particular interest – especially for the Nordic countries, which feature similar arrangements. The paper at hand therefore discusses three initiatives taken in Germany for technological (›Industry 4.0‹) and social (›Work 4.0‹) innovations as well as for new forms of work in the platform economy (crowdworking).
- The debate on digitalisation in Germany has for a long time been restricted to technological and economic aspects, while the social dimension only played a minor role. Within the projects ›Industry 4.0‹ and ›Work 4.0‹, more attention is being paid on working conditions and other social issues. In general, the systematic involvement of key actors such as trade unions and employers' associations and the revitalisation of corporatist structures seem to be a promising strategy. However, concerning new forms of work, the social partners appear to be divided over crucial questions such as legal employment status, social protection, codetermination and interest representation. Here, German corporatism needs to prove its capability to shape digitalization on a cooperative basis.



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1 Introduction

For a number of years now we have been experiencing the accelerated implementation of digital technologies. It is evident that social power and life opportunities have to be recalibrated in the face of changing technology. In the context of digitalisation this goes hand in hand with new challenges for industrial, labour market, social and technology policy. There is particular – also international – interest in Germany's industrial digitalisation strategy, which goes by the name Industry 4.0.

Digitalisation often gives rise to the question of whether German social partnership and the corporatism that underpins it – in the sense of structured agreements between the state, capital and labour – have come to an end. In this contribution we shall show how the state and the social partners – in other words, the key players in the German model – are approaching the challenge of digitalisation and what they envisage when it comes to shaping it. The initiatives they have been discussing in recent years are also of strategic interest for the Nordic countries.

It is important to note here that strategic approaches to digitalisation in different national economies depend on institutional conditions, traditions and power relations. In Section 2, therefore, we outline, first, a global perspective on the conditions and expected effects of a digitalised economy. Germany possesses, on one hand, a stronger position with regard to industrial production, while on the other hand the Nordic countries have progressed much further with regard to everyday digitalisation, especially in services. Besides that, there are numerous similarities between Germany and the Nordic countries. These include theory and practice with regard to productivity, a high esteem for industry, a sustainable welfare state and strong trade unions. In Section 3 we define the central challenges shaping the technological and organisational process of digital transformation. These challenges can form part of an overarching strategic debate whose basic idea is, how can technological and economic progress be turned into new social opportunities for the majority of people? In order to be in a better position to answer this question, in Section 4 we present and discuss three German initiatives for technological and social innovation.

2 Global Perspectives on the Digital Economy

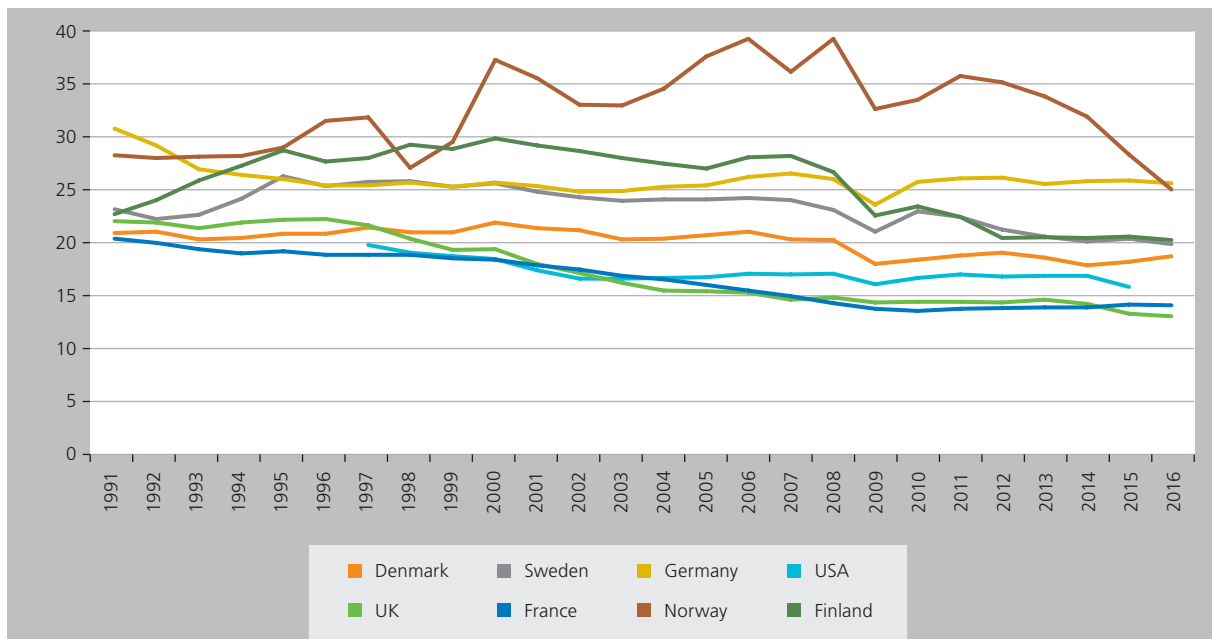
Debates in the OECD countries have long been dominated by talk of the post-industrial service economy (Bell 1973). In parallel with this, in industrialised countries such as France, the United Kingdom and the United States there has been a drastic reduction in industrial capacities over the past 25 years, which is particularly evident in the industry's diminishing share in gross value added. In the Nordic countries, by contrast, development was relatively smooth up until the global financial and economic crisis, as in Germany (Figure 1). As a result, in 2016 industry's contribution to value creation in the Nordic countries was 5 percentage points higher than in France and the United Kingdom, while in Germany it was 10 percentage points higher.¹

In the crisis years 2008/2009, although even the industrial sector in Germany suffered considerable losses, the situation stabilised rapidly, also in comparison with the Nordic countries. This was also decisive in the macroeconomic recovery that ensued. The figures for manufacturing industry, which were low in comparison with the service sector, even for Germany, however, conceal their importance for macroeconomic development, which extends well beyond the sector (see Table 1). Service sector growth is due, on one hand, to corporate outsourcing strategies in the industrial sector. On the other hand, demand for industrial goods also directly affects the service sector and generates both contracts and jobs there; for example, in 2009, manufacturing gave rise to around 3.8 million jobs in the service sector (Edler/Eickelpasch 2013: 16). Developments in the service sector were thus substantially driven by positive developments in the industrial sector. Corporate services have been increasing, while consumer and social services have stagnated (Schmidt 2012: 20).

1. The high share in the case of Norway is comparable only to a limited extent due to the particular contribution of oil extraction.



Figure 1 Share of industry (including energy) in gross value creation, 1991–2016 [%]



Source: OECD 2017a; authors' presentation.

Table 1 Employment and gross value added in manufacturing industry and the service sector [%]

	1970	1980	1990	2000	2010	2016
Employment: manufacturing sector	35.8	31.2	28.3	19.6	17.4	17.3
Employment: service sector	45.1	53.8	59.9	69.6	73.9	74.4
Gross value added: manufacturing sector	36.5	31.0	29.2	23.0	22.2	22.9
Gross value added: service sector	48.3	56.6	61.0	68.0	69.1	68.9

Source: Federal Statistical Office 2017; authors' research.

Two indicators exemplify international competitiveness and innovation. In the WEF Global Competitiveness Index² (2016–2017) Germany ranks fifth, followed by Sweden in sixth place and Norway in eleventh (WEF 2016). A similar, but sharply differing picture is conveyed by the Global Innovation Index, which refers more explicitly to a country's innovativeness. In this instance Sweden stands in second place, Germany in tenth and Norway in twenty-second (Cornell University et al. 2017).

The picture changes somewhat with regard to the integration of digital technologies, as measured, for example, by DESI data.³ These data indicate the Nordic countries' strong digital performance. For example, Sweden's baseline evaluation is significantly higher than Germany's, but also higher than Norway's. Because development in Sweden slowed down in 2016 the country was categorised as »lagging ahead«. Germany, by contrast, belonged among the states deemed to be »running ahead«. Such states are characterised by a baseline level above the EU average when it comes

2. The Index is based on a national economy's sustainable and medium-term prosperity and takes into account a country's productivity and global competitiveness.

3. DESI data summarise indicators of digital performance. The five main areas are connectivity, human capital, internet use, integration of digital technologies and e-government.



to further performance increases. In 2017 Sweden, Norway, Denmark and Finland were in the group of high-performance countries, while Germany was ranked only among the medium performers (European Commission n.d.).

3 Challenges due to Digitalisation

Digitalisation has proven to be a global megatrend with immense consequences for politics, the economy and society. The work-oriented society and gainful employment are key interfaces for the changes arising in the various subareas as a result of digitalisation. What challenges are being generated at the technological level with regard to employment prospects and qualifications? Furthermore, is it not also conceivable that the so-called platform economy will result in a fundamental transformation of employment relations?

Technological Change

Technological change is driven by increasingly cost-effective and, at the same time, more high-performance IT systems and highly efficient algorithms, which make it possible to analyse vast quantities of data (Big Data). This also gives rise to data security issues, in particular data protection. The ways in which the data required for this can be gathered are growing constantly, including ever smaller and more powerful sensors. Development is driven above all by miniaturised and energy-efficient network technology, which in theory enables the networking not only of every product, but also of their individual components (the so-called »internet of things«). Networking affects the entire production process (cyber-physical systems). This takes place both between work piece and machine and also between production locations. This gives rise to new possibilities for comprehensive networking within the value creation process. Among other things this requires standardised interfaces, as well as correspondingly expanded network infrastructure and know-how, not only in large companies, but in particular in small and medium-sized enterprises (SMEs). Furthermore, major development steps in the area of robotics and artificial intelligence are opening up new potential for automation and thus rationalisation. The significance of human/machine interaction is increasing with the far-

reaching digitalisation of the whole production chain (smart factory). At the same time, new possibilities are becoming available for the control and monitoring of employees. The challenges on the technological side include, in particular, inadequate coverage of broadband infrastructure, poor adaptation of new business models, deficient company investment and digital strategies and a lack of standards and interface solutions (Schröder 2017: 4, 19).

Employment

There is particular controversy concerning the employment effects of the considerable potential for rationalisation. The point of departure for the international debate is the much-cited study by Frey and Osborne (2013). According to the authors, around 47 per cent of all employees in the United States are under threat, working in occupations in which jobs could be lost to digitalisation over the next 20 years. At issue here are not only how many jobs will be lost or gained, but also whether this will lead to increasing polarisation in the labour market and the extent to which companies and sectors decline or thrive. The current prognoses differ from already completed innovation and rationalisation measures. In the past, generally speaking, it was the activities of employees with low or medium-level qualifications that were replaced. In the contemporary digitalisation thrust, by contrast, jobs featuring the whole range of qualifications are potentially under threat from automation (Ittermann/Niehaus 2015: 40 ff).

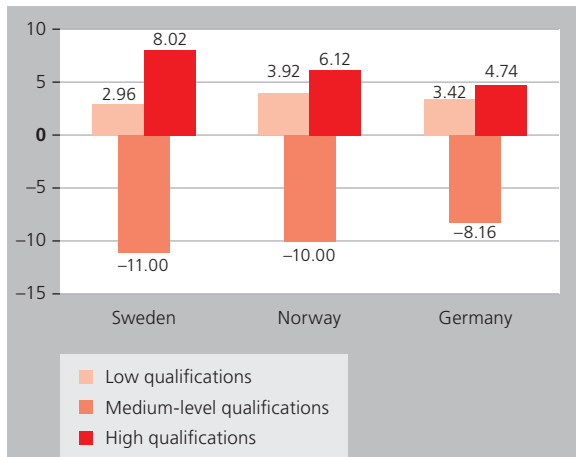
Qualifications

Given the labour market transformation processes that we have described the issue of qualifications assumes key significance. In recent decades we have already seen increasing labour market polarisation (see Figure 2).

In all three countries the proportion of employees in the upper and lower qualification segment is increasing, while the middle segment is in decline. The causes can be discerned in potential rationalisation by means of well structured and rule-oriented activity profiles, based on algorithms (Hirsch-Kreinsen 2015: 19). This gives rise to the question of whether a revaluation or a devaluation of activities is taking place in the middle



Figure 2 Change in the proportion of total employment by qualifications, 1995–2015 [%]



Source: OECD 2017b; authors' presentation.

qualification segment. At the same time, labour market access is becoming increasingly difficult for people with low qualifications. The issue of unskilled labour is of particular importance. On one hand, it suggests further erosion of this form of employment, while on the other technological innovations such as data glasses and tablets may be able to compensate.

Furthermore, requirements as regards work content and processes, as well as the necessary qualifications and skills are also changing at ever shorter intervals. Occupational requirement profiles are becoming more demanding, more networked and more complex. Skills such as abstract thinking, information management and process responsibility are gaining ground (Ittermann/Niehaus 2015: 46 ff). As a result, qualifications, lifelong learning and continuous further training are becoming increasingly important.

Transformation of Gainful Employment

Digitalisation opens up new horizons and possibilities for gainful employment. Digital networking makes it easier for people to work anytime and anywhere, thereby giving rise to autonomy gains and improving employees' reconciliation of work and leisure time. Increasing networking also generates considerable data volumes that facilitate employee monitoring, however. In parallel

with this, new forms of employment are developing that differ radically from traditional employment arrangements. For example, crowdworking via internet platforms is giving rise to employment relations beyond the traditional employer/employee relationship. Individual work contracts are detached from the context of the firm and allocated on internet-based platforms. In principle, this exposes crowdworkers to global competition. Furthermore, existing social protection and participation rights do not apply to these new forms of employment.

The features outlined here show how the many-layered challenges that accompany digitalisation will affect us across the board. This underlines the urgency of a digitalisation debate concerned not only with technological innovation but also social opportunities and innovations on an equal footing.

4 Three Initiatives for Technological and Social Innovations

In this section we hope to foster a better understanding of German digitalisation strategies in order to provide a guide for activities in the Nordic countries. To that end we take up three initiatives that seek answers to the challenges outlined here. We shall take a systematic look at the constellations of actors, negotiation processes and regulatory efforts that have emerged. Besides the organisation of technological (Industry 4.0) and social innovations (Work 4.0) we shall also consider how to tackle new forms of work in the platform economy (crowdworking).

4.1 Technological Innovations: Modernisation of Industry (Industry 4.0)

Internationally, ongoing digitalisation is occurring primarily in a service- and knowledge-based society. From the German perspective, by contrast, at the forefront is a modernised digital industry, which is regarded as key to strategic future-oriented debates in the German economy. At issue are the maintenance and modernisation of the German production model, which increasingly faces competition from Asia and the United States. In this context, besides industry, an increasing interlocking of value creation processes is under way across branches and sectors (Bertschek et al. 2015;

BITKOM/Fraunhofer IAO 2014). The competitiveness and performance of the German economy are based primarily on diversified quality products, sectoral specialisation, path-dependent, research-intensive and export-oriented industries alongside a strong SME sector. This is accompanied by a differentiated, flexible and robust skilled-worker-driven labour regime that promotes productivity and innovation. This set-up cannot simply be updated by means of the increasing digitalisation, so that new initiatives have to be launched in order to open up additional growth opportunities. Germany's »unique path« is based on the significance of digitalisation for the German economy, for which two elements are key.

The first element of this approach to industrial modernisation is the debate on Industry 4.0. This term has become established as a central connecting factor focusing on technological innovations. It is conceived as a project for setting technological standards and achieving market leadership in technological key configurations.

The main feature of Industry 4.0 is the intelligent networking of products and production processes, in which industrial production, automation and information and communications technology (ICT) interact. This involves the comprehensive, real-time internet-based networking of all elements of the value chain. From raw materials and primary products through the production process itself to customer networking and logistics and service processes (BITKOM/Fraunhofer IAO 2014; Bertschek et al. 2015). The constant availability of all relevant information is likely to re-adjust industrial production and enable decentralised, automated and individualised real-time production. Optimised production and distribution processes open up new markets and areas of business that will accelerate competition and innovation cycles.

The Industry 4.0 debate in Germany was born, as it were, on the defensive. The main instigation was the German economy's structural competitive weaknesses in IT as a consequence of the power and innovativeness of the US IT giants, such as Google, Apple and Microsoft. These are also increasingly affecting German industry, augmented by the influence of the Asian economies, which are seeking to upgrade their own hi tech portfolio by means of carefully selected technology purchases in German industry, among other things to break free of their stereotyping as Europe's extended workbench.

The opportunities digitalisation might offer to improve German industry's competitiveness can be concentrated in four dimensions (Prognos 2016: 77):

1. Manufacturing process: digital networking enables more efficient production processes and thus cost savings by optimising resources.
2. Logistics: digital networking enables more efficient flows of goods and information, line efficiency and reduced warehousing.
3. Customer loyalty: closer ties are likely to result from taking individual customer needs into account, not to mention a growing number of post-production services.
4. Hybrid products and related smart services: smart services justify higher prices and enable the expansion of quality production in Germany in terms of high priced industrial products.

Given the key importance of competitive industry for the German economy the future-oriented Industry 4.0 project is now a central aim of strategic economic and industrial policy in Germany. In order to come off the defensive Germany has struck out on a middle path that represents the second element of the »German *Sonderweg* [special or separate path]«. This can be seen as somewhere between the US market-based approach, which approximates to the disruption nurtured in Silicon Valley, and a top-down strategy centred on the state, typified by China (Schroeder 2017: 1). Germany would not rely on state resources alone here, but also resort to the systematic involvement of key actors. Furthermore, it would play to its strengths: on one hand, diversified quality production in engineering and on the other, a politico-economic system based on cooperation that closely integrates the state, companies, science and civil society. The coordinated action of a range of actors is important in order to pry loose the fixation on technological and economic considerations and to make room for social and societal opportunities. A promising strategy requires a revitalisation of corporatist structures. In the German, but presumably also the European context these form the basis for a broad social acceptance and legitimation. In brief, a digitalisation strategy that increases social and regional inequalities and deepens the social divide has no chance of success.



Plattform Industry 4.0

The High-Tech Strategy 2020 action plan adopted by the German government has given decisive impetus for the Industry 4.0 strategy. The main impulse, which in 2013 led to the establishment of the Industry 4.0 platform, was based on the »Recommendations concerning the future-oriented project Industry 4.0« presented by the Industry 4.0 working group (Plattform Industry 4.0 n.d.). Various steering and working groups, as well as task forces cooperate closely within the framework of the platform. This falls under the responsibility of the Federal Ministry of Education and Research (BMBF), the Federal Ministry for Economic Affairs and Energy (BMWi) and representatives of the business sector, academia, industry associations and IG Metall (ibid.). The platform is supposed to accelerate the roll-out of the Industry 4.0 approach and establish the regulatory framework that it requires. Implementation itself, however, would take place by means of competitive activities outside the platform (BMWi 2015: 118).

The substantive work is carried out in five practice groups, dealing with the main challenges and developing recommendations in the form of discussion papers, practical recommendations and guidelines concerning five focal topics:

1. reference architecture and standardisation;
2. research and innovation;
3. security of networked systems;
4. legal framework;
5. work, training and further training.

Companies and associations participated in setting up the Industry 4.0 Labs Network and the Industry 4.0 Standardisation Council initiative in order to accelerate standardisation and transfer of practices. At the same time, in 2016 cooperation was agreed with the US Industrial Internet Consortium to ensure future system interoperability (BMWi 2016). The chief aim here is to lower the entry thresholds for SMEs when it comes to implementing Industry 4.0 technologies. Furthermore, the Industry 4.0 Reference Architecture Model was developed for the purpose of uniform technological orientation. The

platform also supports companies with an online-map which, on the basis of around 320 application examples, shows where Industry 4.0 is already in place and refers to test centres and sources of information and support. An online library offers companies a systematic entry into the topic by means of practice guidelines, publications and studies.

»Future of Industry« Alliance

Until 2015 there was no comprehensive policy coordination arena for Industry 4.0. In response, on 25 November 2014 IG Metall, BDI and Federal Minister for Economic Affairs Sigmar Gabriel launched an initiative for a »Future of Industry« Alliance. It was duly established on 3 March 2015, consists of 17 partners and is coordinated by the Ministry for Economic Affairs. The Alliance aims to foster a »modern and sustainable industrial policy« and to improve the policy framework and industrial competitiveness (»Future of Industry« Alliance 2015). It has the following subgoals:

1. increase industry acceptance;
2. ensure competitiveness by means of investment and innovation;
3. free trade and fair competition;
4. seize digitalisation as an opportunity;
5. strengthen EU industrial policy;
6. recruit skilled workers via immigration.

The Alliance brings together national industry-policy competences and bundles coordination processes. At the same time, the tripartite arrangement between the state, enterprise organisations and trade unions creates a basis of legitimation and reconciliation of interests. Basically, the Alliance partners focus on issues on which they substantially agree.

There are four structural levels. On the first level, the »High-level Group« sets the course for the Alliance. Its members include, besides the Minister of Economic Affairs, the presidents or chairs of enterprise organisations and trade unions. On the second level the »Sherpa round« makes



Table 2 Working groups of the »Future of Industry« Alliance

Objective of the working group	Direction
Working Group 1: Acceptance – Attractive Industry	VCI; IG BCE
<ul style="list-style-type: none"> – General and sector-specific lack of acceptance in industry and technology – Innovation and industry-oriented infrastructure – Communication strategies: prosperity and industry, globalisation and free trade, industrial problem-solving expertise for global challenges – Strengthening civic dialogue on industry-oriented infrastructure and interest reconciliation models 	
Working Group 2: Industry with a high rate of investment	VDMA; IG BAU
<ul style="list-style-type: none"> – Determinants of investment activity by company size (referral to the BMWi expert committee »Strengthening investment in Germany«) – Stock-taking and quantification of private investment needs; obstacles to the modernisation of the capital stock, economic policy framework for private investments – State investments in infrastructure (improved transport, energy and communication network infrastructure, involvement of private capital and education/further training) 	
Working Group 3: Future of work in industry/industry-oriented services	BDA; DGB
<ul style="list-style-type: none"> – New qualification requirements for training and further training – New forms of work – Safeguarding a skilled workforce 	
Working Group 4: Value creation structures of the future	ZVEI; IG Metall
<ul style="list-style-type: none"> – Digitalisation and networking of industrial structures – Industry 4.0 in light of various initiatives, including the IT summit and Industry 4.0 and Innovative Digitalisation of the Economy platforms and other initiatives – New forms of company organisation among SMEs and large companies, innovation culture and making available venture capital and private equity 	
Working Group 5: International competitiveness of German industry	BDI; IG Metall
<ul style="list-style-type: none"> – The German model: an open economy and competitive industry – Determinants include, among other things, research, innovation and quality 	

Source: Bündnis Zukunft der Industrie [»Future of Industry« Alliance] (N.D.); N3tzwerk Zukunft der Industrie (N.D.); authors' presentation.

preparations for the High-level Group's decision-making. On the third level five working groups provide expertise and policy input (see Table 2).

The fourth level comprises the autonomous, independent association »N3tzwerk Zukunft der Industrie« [Future of Industry Network]. The initiative uses this to cultivate direct contacts with the relevant organisations and emphasises that it seeks to operate continuously and regardless of the vagaries of government formation. The chair of the association and the management of the network are undertaken on an equal footing by the employer and the trade union sides.

Recently, similar processes to those observed in Germany have been going on in the Nordic countries. For example, a white paper was published by the Ministry of Trade, Industry and Fisheries, within the framework of the new Norwegian Industrial Strategy 2017, entitled »A Greener, Smarter and More Innovative Industry« (Ministry of Trade, Industry and Fisheries 2017). In 2014, an Innovation Council was established in Sweden comprising representatives of the government, employer organisations, trade unions and the research community (Andersson et al. 2016: 16).



4.2 Social Innovations: Shaping Future-oriented Work within the Framework of Digitalisation

For a long time digitalisation's technological aspects took pride of place. In the past three years, however, in particular the Federal Ministry for Labour and Social Affairs (BMAS) has endeavoured to develop solutions to the social and work-related questions that have arisen due to digitalisation. Particularly worth mentioning in this regard is the dialogue process on producing a green and white paper on the topic, conducted under general heading »Work 4.0«. Even though the Industry 4.0 debates represented an important point of departure, the world of work as a whole forms the reference point for Work 4.0.

Dialogue Process Green and White Paper »Work 4.0«

The dialogue process Work 4.0 represents a new form of discussion and argument on the topic of the work of the future. It was launched in 2015 by the BMAS and continued into 2016 (see Table 3). The intention behind it was to open up the overwhelmingly technology-centred Industry 4.0 debate. Aiming at a kind of »new mission statement for work« technological innovations were to

be complemented by appropriate social innovations. In order to achieve this goal a broad public dialogue was launched, with the participation of the relevant actors from society, politics, academia and business. The focus was on showcasing policy and practical options that would use the opportunities opened up by digitalisation and on properly addressing the challenges and risks involved (BMAS n.d.). The BMAS (2015) green paper »Work 4.0« provided a basis for this.

Within the framework of this process agreement was reached on the relevant social fields of activity for the digital work-oriented society. One peculiarity of the process was its dual dialogue structure: the »normal« expert dialogue (expert workshops) was accompanied by a public dialogue (social media, citizen consultation, film festival) (BMAS n.d.). The findings of the dialogue process are to be found in the white paper »Work 4.0« published in 2016 (BMAS 2017). With regard to the future digital work-oriented society the question is *how* work will be characterised in future, not *whether* there will be work. The key points of reference in this respect include the development of employment (automation, rationalisation and »algorithmisation«), new forms of work (crowdworking, solo self-employment) and new flexibility requirements (working time and place of work). In what follows we seek answers to these challenges.

Table 3 Milestones in the Work 4.0 dialogue process

Date	Milestone/topic
22 April 2015	Launch of the dialogue process »Arbeit weiter denken!« [Thinking ahead about work]
April 2015	Appearance of the green paper »Work 4.0«
12 June 2015	First expert workshop
14 September 2015	Second expert workshop
5 November 2015	Start of the Futurale film festival
30 November 2015	Third expert workshop
February 2016	Appearance of Werkheft [workbook] 01
15 March 2016	Interim conference/»Wertewelten« [value worlds] Tool
23 September 2016	Appearance of Werkheft 02
29 November 2016	Closing conference on the dialogue process
End of 2016	Appearance of the draft version of the white paper »Work 4.0«
14 June 2017	Workshop discussions/experimentation forums/appearance of Werkheft 03
August 2017	Appearance of Werkheft 04

Source: Authors' compilation.

Risk: Massive Employment Reductions –
Answer: Qualifications

The assumption is that digitalisation's effects on the labour market will not be restricted to the elimination of particular jobs as a result of automation and rationalisation, but will also give rise to new jobs with new requirements with regard to qualifications. That means that the labour market balance as a consequence of digitalisation will not be as negative as the predictions for the United States contained in the much cited study by Frey and Osborn (2013) or for Germany, as presented in a study by McKinsey (2017). The BMAS assumes job losses of 1.7 million by 2025. However, that must be set against the creation of 1.7 million new jobs (IAB 2016: 61). A key starting point in the expansion of individual and need-oriented further training and qualification provisions must therefore be to enable employees to keep pace with technological innovations. Three approaches among others are under discussion. First, a »legal entitlement to further training«, in particular for unemployed persons who are unable to find a job within three months. Second, so-called »unemployment benefit Q«, which is intended to allow those in further training to keep drawing unemployment benefit for longer. Third, the notion of a »workforce account« as an alternative to a basic income. Every adult person could receive an account containing around 20,000 euros that they would be able to use, at their own discretion, for further training, obtaining qualifications or starting a business. Many of these elements are focused on prevention. Broadly speaking, the underlying idea is of enabling a transition from a rather reactive unemployment insurance to a preventive employment insurance.

Risk: Eliminating the Boundaries of Work –
Answer: A Fair Compromise on Flexibility

Employers' demand for flexibility – for example, through just-in-time production – must be set against individual needs and wishes with regard to flexible working time and flexible places of work on the part of employees. The policy aim is a life-phase-oriented work and social policy that enables a compromise between these dual flexibility demands. To that end a »law on the exercise of choice with regard to working time« is planned that would facilitate flexible working by means of opening clauses in working time legislation. For example, new working

time models are to be tried out, on the basis of collective agreements. The experimental framework that expressly binds the social partners runs to two years. However, Labour Minister Nahles' legislative initiative failed towards the end of the eighteenth legislative period, in 2016. Something that has been under discussion for even longer is a »right to non-availability« aimed at making it easier to draw a line between work and free time in work processes that can be carried out anytime and anywhere; examples include rules in company agreements on the matter of e-mails sent to workers on vacation and after the end of the working day at BMW or VW. A uniform framework that combines legal and collective agreement regulations could ensure an exact fit in this regard in workplaces.

4.3 Platform Economy: Regulatory Perspectives for Crowdfunding

Crowdfunding is a synonym for the reorganisation of labour markets. In the platform economy internet platforms mediate work assignments between clients and contractors. The latter may be characterised as »crowdworkers«. This form of work allocation changes work relationships and work organisation. The activities of crowdworkers no longer occur in the workplace. Furthermore, the employer–employee relationship is substituted by a contractual relationship between client or platform operator, on one hand, and contractor, on the other. Crowdworkers have therefore to date been classified as solo self-employed and not as dependent employees. As a result, established forms of social regulation cease to apply. Crowdworkers are deprived of all rights based on the status of employee. The further development and treatment of the crowdfunding phenomenon is thus significant from both a labour market and a welfare perspective.

Trade Union Perspectives

It is therefore not surprising that trade unions in particular have been intensively concerned with the platform economy and crowdfunding for a number of years. The issue has been keenly discussed not only within the relevant organisations, but also in the public arena. This is evident in the case of IG Metall and ver.di, the two largest German trade union confederations, which discuss



Table 4 Activities of IG Metall concerning crowdworking

09/2012	Crowdworking as a topic at the annual »Engineering and IT conference«.
10/2014	Book publication: Benner (2015) on the issue of crowdwork.
05/2015	Launch of the website faircrowdwork.org for evaluating crowdworking platforms.
10/2015	Amendment of statutes at IG Metall’s twenty-third conference, enabling the solo self-employed to become trade union members.
12/2015	Book publication: Schröder/Urban (2016) on the topic of decent digital work.
01/2016	Amendments of statutes come into force.
04/2016	First meeting with important German platforms. First meeting with international actors for the purpose of coming up with a joint declaration on platform work.
06/2016	Workshops with crowdworkers on various German platforms.
07/2016	Start of the BMBF cooperation project »Cloud and Crowd« (cooperation with ISF, LMU, University of Kassel, ver.di, andrena objects).
12/2016	Publication of the Frankfurt Declaration on Platform-based Work (resulting from an international summit in April 2016).
01/2017	New version of the Code of Conduct of several crowdworking platforms with the participation of IG Metall.
03/2017	First transfer conference of the BMBF cooperation project »Cloud and Crowd«.
06/2017	Relaunch of the website faircrowdwork.org. Press conference »Crowdworking by international comparison« on the publication of the study »Crowdwork – A Comparative Law Perspective« (Waas et al. 2017).
11/2017	Platform economy as a topic at the annual »Engineering and IT conference«.

Source: IG Metall 2017; ISF 2016; authors’ presentation.

solutions from various perspectives and have developed their own concrete approaches for this group.

IG Metall, which picked up this issue early on, has increasingly been involved in international cooperation (Table 4). One example of this is the possibility to evaluate platforms on faircrowdwork.org. Noteworthy is the joint declaration by seven international trade unions, developed under IG Metall leadership, on how to deal with platform-based work (IG Metall et al. 2016). The Swedish trade union Unionen was one of the participants in the discussions and the declaration. At its twenty-third conference in 2015 IG Metall amended its statutes to enable the solo self-employed to become trade union members.

In the case of ver.di, it has been possible for the solo self-employed to become members since 2001. Today, ver.di organises around 30,000 solo self-employed, addressed via a specific communication medium, the »mediafon« (cf. ver.di n.d.).

At the substantive level four dimensions are key to dealing with the phenomenon of crowdworking:

1. employment status: categorisation between self-employed and dependent employment;
2. social protection: existing legal regulations and rights are linked to employee status;
3. income: current legal regulations on minimum wages do not extend to the free drafting of contracts among the self-employed;
4. codetermination and interest representation: company codetermination rights are linked to the concept of the firm. Cartel and competition law limits self-organisation of the self-employed.

The handling of these four dimensions is found not only in key trade union documents (IG Metall et al. 2016). They are also among the fields of activity identified for the commission »Work of the Future« set up in 2015 by the



Table 5 Ver.di’s crowdworking activities

09/2008	Publication of the »Berlin Manifesto« »Public Services 2.0. Strengthening services of general interest in the information society«.
08/2012	Book publication: Bsirske et al. (2012) »Grenzenlos vernetzt? Gewerkschaftliche Positionen zur Netzpolitik« [Boundlessly networked? Trade union positions on network policy].
10/2012	Publication »Crowdsourcing and Cloudworking: dangers for society and employees« (»Berlin Crowdsourcing-Cloudworking paper«).
09/2014	First digitalisation conference »World of work, self-determination, and democracy in the digital age«.
06/2015	Second digitalisation conference »Work 4.0: dignity, self-determination, solidarity and decent work in the digital society«
09/2015	Trade union conference resolution on »decent work and decent services in the digital world«. Publication of a special issue of AiB on the topic of crowdworking.
12/2015	Book publication: Schröder/Urban (2016) on the topic of decent digital work.
07/2016	Start of the BMBF cooperation project »Cloud and Crowd« (cooperation with ISF, LMU, University of Kassel, ver.di, andrena objects).
10/2016	Third digitalisation conference: »Work and society 4.0: codetermination, participation« Publication: discussion paper »Work 4.0« requires participation on an equal footing. More codetermination and democracy in the digital world of work.
03/2017	First transfer conference of the BMBF cooperation project »Cloud and Crowd«.
11/2017	Fourth digitalisation conference: »Participation in shaping the public services of the future« [Öffentlicher Dienst der Zukunft – mit://gestalten].

Source: Authors’ compilation.

trade union–linked Hans-Böckler-Stiftung. The proposals for action and issues for consideration listed in the commission’s final report (Jürgens et al. 2017) coincide to a considerable extent with the positions formulated by trade unions and the BMAS. The commission regards a redefinition of the concepts of employee and the firm as central to the future shaping of the work-oriented society.

The employers and trade unions are at odds on many of the questions thrown up by the platform economy and crowdworking (see Table 5). The trade unions see a need for comprehensive regulation, while the employers and those in their orbit generally oppose regulation. One fundamental point is that the trade unions regard crowdworkers as employees or dependent workers, dependent on the platform or those allocating contacts. A redefinition or adaptation of the existing conception of employee would have to take this into account. Having said that, this would render superfluous the questions of social protection and the minimum wage.

With employee status mandatory protection would have to be created for crowdworkers or the social security system restructured as a citizens’ insurance system. With regard to funding, the clients and/or platform operators would have to make their own contributions. Working conditions can be tackled by defining minimum standards on terms and conditions, for which the platform operators could be made liable. Besides that, the establishment of a minimum fee or a remuneration scheme could ensure that the incomes of crowdworkers would not be below the existing minimum wage level.

With regard to codetermination a redefinition of the concept of the firm is regarded as necessary. This should be extended to crowdworkers, similarly to other groups of employees who so far have not been bound by allocation to a firm as a territorial entity. In this way these groups, because they contribute to company value creation, would fall under existing company codetermination rights.



Table 6 Regulation of crowdworking – social partner perspectives and proposals

	Trade unions	Employer/business/sectoral organisations
Employment status	Legal clarification is needed with regard to whether crowdworkers are self-employed (objective/economic dependence). To that end, clarification is required with regard to the status of platforms or clients in terms of the employer function. If crowdworkers are not employees, then it may be that a special labour law status should be created for them (in Germany there are already persons with the same status as employees [parasubordinate]).	Crowdworkers, as self-employed, are not personally dependent on platforms or clients. There is no need for regulation because existing regulations on distinguishing between dependent employment and self-employment, on temporary employment, on service contracts and on bogus self-employment are sufficient.
Social protection	Introduce mandatory old-age provision and create citizens' insurance/employment insurance. The platforms and/or clients should contribute to funding this.	Self-employed people are independent and self-reliant with regard to social protection responsibilities. Mandatory insurance would harm employment and thus mandatory provision is conceivable at best at the minimum level.
Income	Introduction of minimum remuneration or a remuneration regime at the level of the minimum wage or remuneration that is customary in the local area as paid by traditional employers taking qualifications into account. Profit-sharing in sales through copyright. Minimum requirements for terms and conditions; platforms would be liable for compliance.	Service provision takes place on a self-employed basis and the fee is thus subject to contractual freedom.
Codetermination and interest representation	Extension of the concept of the firm so that crowdworkers and outsourcing fall under mandatory codetermination. In addition, make it easier for crowdworkers to organise themselves by giving trade unions access to platforms and enabling exceptions in competition law to make it possible for the solo self-employed to engage in collective bargaining.	No extension of codetermination is needed because the crowdworking phenomenon is not substantial enough.

Source: Authors' compilation.


Employers' Perspective

The employers' perspective differs significantly from the demands of the trade union side. It is not just that they take a different view; rather there are explicit demands for further deregulation in order to nail down flexibility for companies. In particular, employers demand a flexibilised working time regime. »Rigid« rules on working time are no longer appropriate in a digital, sometimes non-site-specific world of work. With particular regard to crowdworking, in many cases employers simply reject any need for regulation.

Crowdworkers are regarded as self-employed, working flexibly, independently and self-reliantly. The existing legal regulations that differentiate between the self-

employed and dependent employees, regulate temporary employment and service contracts or are supposed to prevent bogus self-employment are regarded as sufficient for determining the status of crowdworkers. Because the latter are generally classified as self-employed they are responsible for their own social protection and have a say in their remuneration due to freedom of contract. Minimum standards, remuneration regimes or an extension of social protection, in their view, are neither necessary nor appropriate. At most, in exceptional cases, a minimum level of protection might be considered for persons in particular need of it.

Overall, the trade unions are calling for a broad range of regulations and demands, with an equally wide range of detail. The employers pretty much take the opposite view.



They generally consider regulation to be unnecessary and even call for further deregulation. All actors, however, are agreed on the need for further studies to ensure a reliable assessment of future developments and the real significance of the platform economy and of crowdworking for the labour market.

5 Conclusion

In the debate on digitalisation the technological and economic aspects long took centre-stage. With the projects Industry 4.0 and Work 4.0 the social dimension – in other words, the shaping of good working conditions – was included. This has expanded the arena considerably. This is the result of a realisation that a discourse restricted to technological issues was inadequate to the economic and social requirements and challenges of digitalisation. This is because the active social shaping of this process requires a broad social basis. This applies not only to the debates on the sustainable organisation of the digital world of work, but especially to its concrete implementation. This therefore entails a broad range of relevant actors from the state, associations, civil society and academia who should be taken notice of, involved and included.

The social partners have generally taken a positive approach to the challenge of digitalisation. The trade unions in particular from the very outset have not sought to obstruct digitalisation as modern Luddites. They emphasise the opportunities that digitalisation offers, although without losing sight of the risks, which they demand must be tackled. The trade unions began to develop their position and to make proactive proposals early on. With regard to the further development of Germany as an industrial location – and thus at the level of technological innovation – there is broad consensus with the industry associations. In other areas – which in particular are to be classified at the level of social innovation – there are marked differences of interest with regard to the way forward, especially when it comes to performance, data protection and working time policy. There is a particular conflict of interests between trade unions and employer organisations with regard to the evaluation of crowdworking within the framework of the platform economy.

The creative impetus among the social partners is matched at the level of the state. The policy initiatives Work 4.0 and Industry 4.0 use cooperative platforms to sound out common standpoints between the participating actors. In this way the idea is to reduce the risks accompanying digitalisation, while taking advantage of their opportunities and establishing the necessary framework. The initiatives are thus counting on a strengthening of social partner and company negotiation processes. The often heralded demise of German corporatism thus appears to be exaggerated. At the same time, it is not clear whether the structure developed under the aegis of the Social Democrats aimed at shaping digitalisation on a cooperative basis will be continued under a centre-right government with SPD participation.



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About the authors

Prof. Dr. Wolfgang Schroeder teaches political science at the University of Kassel. His main areas of research are trade unions, industrial relations, social policy and social insurance system. He was State Secretary in the Federal Ministry of Labour and Social Affairs in Brandenburg from 2009–2014.

Dr. Samuel Greef teaches political science at the University of Kassel. His main areas of research are internet policy, digitalization, industrial relations and trade unions.

Benedikt Schreiter teaches political science at the University of Kassel. His main areas of research are trade unions, industrial relations, social policy and digitalization.

Imprint

Friedrich-Ebert-Stiftung | Western Europe/North America
Hiroshimastraße 28 | 10785 Berlin | Germany

Responsible:
Michèle Auga, Head, Western Europe/North America

Tel.: ++49-30-269-35-7736 | Fax: ++49-30-269-35-9249
<http://www.fes.de/international/wil>
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Orders/Contact:
FES-WENA@fes.de

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