4. Digitalization and social dialogue: Challenges, opportunities and responses*

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1. INTRODUCTION

In the past few decades, the world of work has been affected by many different vectors of change. These have called into question the standard employment relationship, understood as full-time, open-ended employment. Among these changes, very different in their nature, intensity and effects, we might mention the demise of full employment as an economic policy objective, labour market deregulation in a quest for more efficient labour markets – which (allegedly) would bring about lower unemployment – globalization and the growth of a worldwide labour market, and the new technological revolution related to the ubiquitous use of information and communication technology (ICT) and the digital revolution.

The purpose of this chapter is to review the extent to which the digitalization of the economy is transforming the world of work, as well as the role, now and in the future, of social dialogue in helping to improve the governance of these changes, minimizing their negative impact on labour markets and incentivizing their positive effects. In this regard, it is important to acknowledge from the start that the social partners themselves face a major challenge when addressing these changes, not least because, it can be argued (Vaughan-Whitehead 2018, 2019; Müller et al. 2019), one of the casualties, whether intended or unintended, of the above-mentioned changes has been the weakening of social dialogue itself, especially above company level, and the labour and employee institutions responsible for it (see Chapter 2 in this volume).

With that aim, after briefly presenting the main technological changes related to what we generally denominate in these pages as ‘the Digital Revolution’, in section 2 we review the actual or expected impact of such changes and the potential role that social dialogue could play in addressing them. Against this background, section 3 analyses the level of awareness and concerns of the social partners regarding the implications of these changes. That section also reviews the extent to which issues related to the Digital Revolution are being taken into consideration in social dialogue at different levels (European, national, sectoral or firm). With that aim, we undertake a short and selected journey around a sample of European Union (EU) member states, highlighting their experiences in this area. Section 4 sees a change of perspective and reflects on how some of the innovations that form part of the Digital Revolution could be used to revamp collective action by the social partners in a type of ‘Trade Union or Employee Organization 4.0’. To conclude, section 5 presents the main findings of the analysis.

According to Eurofound (2018a), the Digital Revolution is affecting work and employment along three different vectors of change: (1) automation, (2) the development of sensors and devices that allow the transformation of production processes into digital information and vice versa (scanners and three-dimensional printers, for example) and (3) coordination by platforms. Fernández-Macias, author of the above-mentioned report, covers all of this with the neologism 'digitization'.

Of these three vectors of change, the first is an old acquaintance of political economy, as the debate on the implications for employment of introducing machinery has been going on at least since the third edition of Ricardo's *Principles of Political Economy and Taxation* in 1821 (Ricardo 1821 [2015]). This interest is renewed every time a new wave of technical change leads to further automation of work, as is nowadays occurring with the Digital Revolution. In this regard, it is argued, the new technology, by substituting labour for capital, will reduce the labour input needed to produce a unit of output (the labour/output ratio), making it more difficult to achieve full employment.

The second vector of change is certainly more novel, as the Internet of things may make it possible to transform whole production processes into digital processes, contributing to the automation of production to unprecedented levels, as well as reaching sectors of economic activity hitherto protected from it. The labour market implications of these two drivers, automation and digitization, would be further exacerbated by the development of machine learning and artificial intelligence (AI) that may change the way humans interfaces in the production of many goods and services.

The third vector of change is related to the possibilities generated by the new digital technologies to develop a new model of the firm, the platform, which maximizes the coordination potential of computerization and algorithms in order to act as pure intermediary between the clients of a given good or service and the workers producing it. According to Coase's theory of the firm (Coase 1937), the existence of firms in competitive markets is explained by high transaction costs related to market exchange between suppliers at the different stages of production of a given good or service, which make it advisable, and cheaper, to produce it under the umbrella of an organization (the firm) that uses planning to allocate resources internally and the market to relate to customers. In this respect, the existence of vertically integrated firms in a given market would imply the presence of high transaction costs as, in its absence, firms would be substituted by a myriad of workers-cum-firms taking care of the different stages of production of the good or service and selling it in the market to other producers further up the production process. If we accept this line of reasoning – which won its author a Nobel Memorial Prize for Economics – the new technologies, by greatly reducing transaction costs in many markets, would allow the development of new business models, with important implications for working conditions. Section 2 briefly reviews the potential impact on labour markets and social dialogue of these drivers of change.

2. THE POTENTIAL EFFECTS OF DIGITALIZATION ON LABOUR MARKETS AND THE ROLE OF SOCIAL DIALOGUE

2.1 Digitalization and Employment

Probably the first public concern regarding the economic implications of the Digital Revolution is its potential impact on employment. If the new digital technologies, empowered by machine learning and AI, increase the rate of substitution of labour by capital, whether robots or computers, the economy might not have sufficient capacity to create jobs at the pace needed to absorb those destroyed by the new digital capital. From a macroeconomic perspective, the increase in productivity related to the introduction of new technologies will result in lower employment levels only if the rate of growth of productivity is higher than the combined effect of the increase in demand (gross domestic product growth) and the reduction in working time. Despite the long-standing fears of technological unemployment (Keynes 1930 [2010]) associated with the different waves of technical change (Mokyr et al. 2015), in the long run the combination of economic growth and reductions in working time (with varying importance at different stages) has made it possible to reconcile technological change and employment growth. This is also valid for the recent past, when the introduction of digital technologies has been compatible with growing or stable employment rates, even in a context of economic crisis and sluggish growth. As can be seen in Figure 4.1, in 2018, employment to population ratios in the Organisation for Economic Co-operation and Development (OECD), the group of high income countries (HIC), the EU and the United States were similar to those a

Source: World Development Indicators.

Figure 4.1 Employment to population ratio, 15+, total, 1991–2018 (percentage)

quarter of a century ago, namely, around 60 per cent in the United States and 54 per cent in the EU.

Nevertheless, many technologists and technological gurus (such as Brynjolfsson and McAfee 2014) argue that this time it is different owing to the sheer ubiquity of application of the new technologies – in the past they were limited mainly to agriculture and manufacturing – and their unprecedented potential impact on productivity.¹ In this regard, in the past decade, different researchers have produced estimates about the probability of job replacement by machines in the medium term. As we can see in Table 4.1, these estimates vary widely, even wildly, from 9 per cent of jobs, according to the analysis of Arntz et al. (2016) for the OECD, to nearly half of all jobs, 47 per cent, according to the pioneering estimates of Frey and Osborne (2013 [2017]).

Without going into detail in analysing the previously mentioned estimates and the reasons behind their differences,² two elements need to be highlighted. The first is that risk of automation is not the same as employment lost, since there is a long distance between the possibility of automating a task and doing so. Jobs are bundles of tasks, and the automation of one task should not be equated with the automation of the job. Indeed, when the analysis is made in relation to tasks, not occupations, the results obtained move towards the lower range of the estimates. The second element is that even when entire jobs (or occupations) are substituted by machines, this does not mean that

Table 4.1 Estimates of jobs at risk owing to the Digital Revolution

Authors	Criteria	Results
Frey and Osborne (2013 [2017])	Probability of the occupation being replaced by machines $\geq 70\%$	USA: 47% of jobs highly susceptible to substitution
Bowles (2014)	Frey and Osborne methodology. Probability of the occupation being replaced by machines $\geq 70\%$	EU = 54% at 'high risk' of substitution, ranging from 47% in Sweden to 62% in Romania
Arntz et al. (2016)	Probability of the job being replaced by machines $\geq 70\%$	USA: 9% of jobs at risk of substitution OECD: 9% (ranging from 6% in Korea to 12% in Germany)
Nedelkoska and Quintini (2018)	Probability of the job being replaced by machines $\geq 70\%$	USA: 10% of jobs at risk of substitution OECD: 14% (ranging from 6% in Norway to 33% in Slovakia)
McKinsey Global Institute (2017)	Thresholds for the technical automation potential of individual occupations	Threshold of 70%: 26% of occupations Threshold of 30%: 60% of occupations
COE (Employment Advisory Council) (2017)	Automation index based on the characteristics of work described by employees ≥ 0.7	10% of French jobs at high risk
Dengler and Matthes (2018)	Occupations where the proportion of substitutable tasks $\geq 70\%$	15% of all German workers are at high risk

Source: Bowles (2014); Dengler and Matthes (2018); Valenduc and Vendramin (2019, p. 7).

there would necessarily be an equivalent decrease in total employment, as there are different compensation mechanisms – in many cases related to technological innovation itself – that work the other way, generating employment. For example, workers at risk are flexible and adjust, performing new tasks that complement the new technology; production of the new machinery requires labour; the increase in productivity derived from the introduction of new technology might lead to increases in competitiveness, demand and employment, and so on (Arntz et al. 2019).

While the overall impact of these conflicting effects of technological change can be neutral, or even positive, there is nothing automatic about them, so the fear of technological unemployment remains a possible future scenario. Also, even if such a negative scenario does not materialize, the different national economies would face a churning of jobs, and of labour demand, with decreasing demand for specific types of jobs or tasks, and increasing demand for others, a question that we address in the next section.

2.2 Changes in Employment Structure

The Digital Revolution, as for previous waves of innovation, is, to borrow from Schumpeter (1942 [2003], p. 83), ‘a process of creative destruction’, leading to the growth of some sectors of activity and jobs within them, and the reduction or disappearance of other (now old) sectors and jobs. Two different hypotheses have been developed regarding the shape of that process of creative destruction in the realm of employment. According to the first, known as skill-biased technical (or technological) change (Levy and Murnane 1992), digital technologies mainly substitute low-skilled jobs, while complementing high-skilled jobs, leading to an upgrading of the employment structure. Alternatively, the routine-biased technological change hypothesis considers that new technologies mainly affect jobs composed of routine tasks, both manual and non-manual. These perspectives have implications in relation to the types of jobs destroyed as the new technologies are introduced into production systems. In the first instance the adoption of new digital capital would lead to an upgrading of the employment structure (concentration of the destruction of employment in low-wage jobs and employment creation in high-wage, high-skilled jobs). In contrast, according to skill-biased hypothesis, the destruction of jobs would be concentrated in the middle range of the employment structure, where routine jobs are found, as both ends are characterized by tasks less routine intensive – manual at the lower end and intellectual at the upper end – leading to a polarization of the employment structure as employment growths at both ends of the wage distribution.

Thus far, the empirical analysis has not been able to offer a clear answer regarding the dominant pattern of employment change. Although some researchers argue that routine-biased technological change can be found pervasively across all high-income countries (Goos and Manning 2007; Goos et al. 2009, 2014) others (Fernandez Macias 2012; Fernandez Macias et al. 2012; Eurofound 2015; Oesch and Piccitto 2019) argue, more persuasively in my opinion, that different countries follow different patterns of structural employment change, often depending on circumstances (for example, polarization during recessions and upgrading during recovery). As stated in a recent joint report of Eurofound and the European Commission Joint Research Centre (2019, p. 55), ‘the dominant pattern of recent occupational change in Europe ... is one of upgrading with some

Source: European Jobs Monitor (<https://www.eurofound.europa.eu/data/european-jobs-monitor>, accessed 4 March 2020).

Figure 4.2 Employment shifts by job-wage quintile, France, Germany, Italy, United Kingdom, 2011–16

polarization. ... But behind this dominant pattern, there have been significant variations in the patterns at national level'. This diversity is evidenced in Figure 4.2, which reproduces the evolution of employment, ranked from the lower quantile of jobs in the wage distribution to the top quantile, from 2011 to 2016, in the United Kingdom, France, Italy and Germany. These countries show different employment growth patterns, from asymmetrical polarization in Italy (growth at both ends, but much more intense at the lower end), to upgrading in Germany and, with lower intensity, in the United Kingdom, and with France showing a distinctive pattern of difficult classification.

This debate about the future structure of employment, whether upgrading, polarization or something else, has important implications for the future of work and social dialogue. The first of these is that the strength and representativeness of the social partners can differ across different types of jobs and sectors of activity (manufacturing, for example); the second is that the existence of a pattern of destruction and creation

of jobs in different parts of the wage distribution (that is, also in different parts of the distribution of jobs according to educational requirements) will make the transition of redundant workers from one part of the labour structure to another more difficult, especially if, as the two hypotheses claim, the upper tail is always one of the growing areas of employment. In section 2.3 this issue is discussed specifically.

2.3 New Skills and Skills Obsolescence

A context of rapidly changing production technologies, with swift transformations of whole sectors and jobs, will undoubtedly affect the skills and type of education demanded by employers. However, the uncertainty generated by the lack of knowledge as regards the type of skills that the digital technologies of the future will demand makes it difficult to determine how to prepare the labour force for the coming changes. As stated in a background report prepared for the 2016 OECD ministerial meeting on the digital economy, ‘while there is awareness that the skills profile of citizens and workers will be very different than in the past, the skills of the future are difficult to identify with certainty due to fast technological changes’ (OECD 2016, p. 4).

Against this general background of uncertainty, there is agreement that the new technologies will increase demand in science, technology, engineering and mathematics (STEM) subjects. Currently, this area shows an obvious gender bias, with only 12 per cent of total female graduates (ISCED 5–6) graduating in mathematics, science and technology compared with 37 per cent of male graduates (Eurostat 2012, Tertiary education graduates).

If we look at the situation in 2015 (Figure 4.3), most EU workers (57 per cent) consider that their training fits their duties well, while 28 per cent believe that they could cope with more demanding duties. Nevertheless, that leaves 14 per cent of workers who consider that they need further training to cope with their obligations; therefore there is a lot of room for improvement. Although these figures are similar to the 2010 results, there has been a small decrease in the percentage of ‘over-skilled’ workers (4 percentage points higher in 2010), which could be related, among other things, to the increase in demand for skills during the period (as well as to the improvement in matching between worker’s skills and skills demands owing to the reduction of unemployment rates).

When it comes to anticipating what type of skills will be needed in the future, the previously mentioned uncertainty about demand makes it advisable to invest in general skills that would facilitate accelerating training in specific skills when new needs emerge. As we know from human capital theory, firms might be reluctant to finance general training (easily mobile), making it a relevant issue for social dialogue at different levels. Also, the information available on skills shortages in OECD countries (Skills for Jobs OECD database) indicates the importance of shortages in basic skills (both content and process)³ compared with technical skills,⁴ which are slightly in surplus in the EU.

Furthermore, training (understood in a general sense, including lifelong learning and adaptive skills) for the digital economy is a field of interest for the social partners: for firms, as training might reduce bottlenecks and wage increases in some areas, fostering productivity and competitiveness; and for trade unions, as training might reduce the risk of unemployment, facilitate transitions between jobs and reduce the risk of a growing digital divide for workers at the margins of the digital economy. According to Eurostat,

Source: European Working Condition Survey 2015.

Figure 4.3 Workers according to their assessment of the discrepancy between their skills and their duties

in 2017, 17 per cent of EU the labour force had no digital skills or no Internet use, with important differences between countries, ranging from 3–5 per cent in Denmark, the Netherlands and Sweden to 36–37 per cent in Bulgaria and Romania.⁵

To conclude this section, it is worth referring to the estimates of the share of employment in occupations at high risk of automation, which would need a substantial training effort to facilitate transition to occupations at lower risk of automation. According to the OECD's *Skill Outlook 2019* (OECD 2019a) the simple average of employment at risk with significant training needs to recycle ranges from 0.9 per cent (lower bound) to 3.2 per cent (upper bound). There are marked differences between countries: Belgium and Norway, for example, have very low percentages of employment at risk with high retraining needs (less than 2 per cent in the upper bound), while others, such as Slovenia or the Czech Republic, have an upper bound estimate of almost 6 per cent (OECD 2019a, p. 108). To put these numbers in context, in the EU28, according to Eurostat's *Adult Education Survey* in 2016, slightly over half of the working population participated the previous year in formal and informal education and training (with a high of 74 per cent in the Netherlands and a low of 8 per cent in Romania). As regards economic resources needed to confront such increases in training needs, the OECD analysis sets the direct cost in terms of gross domestic product (GDP), for the EU19 countries analysed, as between 0.12 per cent for Belgium and 0.48 per cent for Italy.⁶

2.4 New/Revival of Old Types of Labour Relations

One of the stylized facts of the labour market in the twenty-first century in high-income countries is the increasing importance of non-standard employment relations (NSERs), taking the open-ended full-time contract as the standard employment relationship.

In 2018, 14 per cent of EU28 employees were temporary workers, and more than 20 per cent in the Netherlands, Portugal, Poland and Spain. The same year, the part-time employment rate in the EU, this time in relation to total employment, reached 19.2 per cent (22.5 per cent in the EU15), with higher rates in Sweden, Belgium, the United Kingdom, Denmark, Germany, Austria and the Netherlands. Finally, close to 10 per cent of workers are own-account workers (self-employed persons without employees), with as many as 21.5 per cent in Greece and 14.9 per cent in Italy.

Different non-standard forms of employment have different implications. Temporary employment can be considered a problem when it becomes a permanent feature of the labour market, with a large proportion of workers going, involuntarily, from one temporary job to another. Part-time employment is especially negative when part-time workers do so involuntarily because they have been unable to find a full-time job. In 2018, around 25 per cent of all part-time employment was involuntary, with rates reaching 65.7 per cent in Italy and 56 per cent in Spain. Finally, regarding own-account workers, two questions have gathered most of the attention devoted to the topic. The first is their vulnerability in a context in which social protection has been developed largely on the basis of dependent employment. The second is the possibility, difficult to trace in Labour Force Survey (LFS) statistics, that in the past few years the growth of own-account workers is the result of the transformation of standard dependent employment relations into an apparent mercantile firm–firm (own-account worker) relationship that releases the hiring firm from its obligations in terms of labour and social security regulations. A recent report of the European Political Strategy Centre (2019, p. 4), summarizes neatly the different sides of these new forms of work:

Non-standard work can offer benefits such as enabling a wider range of workers to enter the job market; facilitating the accommodation of family or personal obligations or activities; or enabling companies to restructure their activities or improve their performance. However, while initially considered a stepping stone towards the regular labour market, there is mounting evidence that suggests people are being trapped in atypical employment contracts.

This trend predates the Digital Revolution and is related to the labour market deregulation wave of the 1990s. For example, in Spain it can be traced back to 1984, in a context of massive unemployment, and was justified by the government as a policy to improve employment growth. However, some of the characteristics of the new digital technologies could make these types of employment relations especially attractive, and viable, for firms.

The development of a new business model, the platform, based on, among other things, the use of huge amounts of information in real time and the algorithms and computing capacity to manage them at low cost, makes it possible to split production processes into simple tasks that can be carried out by individual workers all around the world. Although there are many different types of platforms⁷ and, thus far, their impact on the labour market is far from significant – according to Pesole et al. (2018) around 2 per cent of the adult population in the EU⁸ – there is a lively debate, both public and legal, about the employment status most platforms confer on the workers who perform the jobs coordinated by them, above all whether such employment should be considered dependent employment or not. Following one or the other path has implications in relation to the labour regulations applied, as well as platform

workers' access to social protection, as in most EU countries the self-employed are less protected by labour regulations, have access to lower social protection and have to finance all of it (in contrast with employees). Alternatively, the self-employed might enjoy benefits in relation to flexibility of working time, autonomy or taxation, but these advantages only materialize for true own-account workers, and not for the bogus self-employed.

The issue of non-standard employment relations and their use by the new digital firms can be conflictual, as employees' organizations usually defend these new forms of work and employment as a way to increase the flexibility of labour and reduce costs: 'Companies' adaptability to change is a key factor in their competitiveness. Successful companies are those that restructure their activities quickly in response to market conditions. Flexible contracts and flexible working time arrangements play an important role in this respect' (BusinessEurope 2017, p. 4). In contrast, trade unions focus on the deterioration of working conditions often related to these forms of employment. As stated by the European Trade Union Confederation (ETUC) in its Resolution 'A fairer labour market for Europe: an ETUC vision' of 26–27 March 2019, 'Employment rates have continued to rise incrementally but too often at a cost of poor quality and precarious forms of work which, as well as being detrimental themselves, also prohibit access to social protection and pension entitlements when they end.' In the EUTC definition of quality of work, work security via standard employment and access to social protection comes in at second place, after good wages, in a list of six items.⁹

2.5 Changing Health and Safety Risks

Digital technologies and automation reduce some of the occupational safety and health risks related to moving heavy loads or performing strenuous and dangerous tasks, thanks to the full substitution of labour for capital in these areas (EU-OSHA 2018, p. 89) or to the development of new supporting instruments, such as drones, wearable robots, including exoskeletons, with potential use across a range of industries to prevent chronic injuries and support workers. Drones for instance are increasingly used for recreational, public and industrial purposes, not just military. Drones have the potential to prevent construction-related injury and death, toxic chemical exposures, electrical hazards, or traumatic injury from vehicle and equipment collisions. Improvements in this area should not be dismissed as unimportant in services societies, as in 2015, 32 per cent of EU workers had jobs that involved carrying or moving heavy loads at least a quarter of the time (European Working Conditions Survey 2015, Eurofound). ICT also facilitates teleworking, which can improve, under some circumstances, work–life balance. In 2018, according to the European Union Labour Force Survey (EU-LFS), almost 9 per cent of EU employees teleworked sometimes, compared with 5.6 per cent in 2002, with countries such as Sweden showing much higher rates (26 per cent) and growth (in 2002 only 3.3 per cent of employees teleworked occasionally).

However, digital technologies are also the source of new occupational safety and health-related risks, owing to, for example, the following:

1. The reduction of workers' control of the production process, as the speed and order of tasks are decided by new digital devices.

2. The development of new tools for monitoring (and rewarding) workers might contribute to increasing levels of anxiety and work pace and a reduction of privacy: ‘psychosocial and organizational factors that will become increasingly more important because ICT-ETs can drive changes in the types of work available; the pace of work; how, where and when it is done; and how it is managed and overseen’ (EU-OSHA 2018, p. 6).
3. The blurring of the work–private life divide, with new demands to be available 24 hours a day, seven days a week (24/7) as permanent reachability is interpreted as permanent availability. The debate on the right to disconnect, which has now been incorporated in French legislation, reflects the importance of this risk.
4. While new technologies help to reduce old health risks, they contribute to the development of new risks. To name only a few: the use of display screen equipment (DSE) can contribute to musculoskeletal disorders (such as such as carpal tunnel or tendonitis) and fatigue and eye strain; the use of body-worn assistive devices (exoskeletons), while reducing physical stress in some local body areas, might lead to higher levels of stress in other body regions (EU-OSHA 2019).
5. Finally, as a recent report for the Dutch Ministry of Social Affairs and Employment (TNO 2018) shows, cohabitation with robots poses new occupational safety and health (OSH) risks of at least three kinds: robot–human collision risks as machine learning can lead to unpredictable robot behaviour; security risks as robots’ Internet links can affect the integrity of software programming, leading to safety vulnerabilities, and environmental risks owing to sensor degradation and unexpected human actions in unstructured environments.

A recent report on the OSH implications of the digital transformation in the European chemicals sector (Kramer et al. 2019), exemplifies these different vectors of change. While 50 per cent of the affected workers see a slight to strong decrease of hazardous tasks, 70 per cent consider that there is a risk of increasing levels of psychological stress, especially in large firms. Around 42 per cent of the affected workers consider that there will be no major overall change in the general health of the workforce.

2.6 The Role of Social Dialogue

After reviewing the different potential impacts of the Digital Revolution on the labour market, in this sub-section which is an introduction to the following section dealing with the social partners’ response to such challenges, we present a brief speculative account of the potential role of social dialogue, at different levels, in dealing with these changes.

Table 4.2 presents the labour market implications of the Digital Revolution, together with a tentative sketch of the role of social dialogue in addressing these challenges. The first of the effects, the possible negative impact on total labour demand owing to the acceleration of the substitution of labour for capital, is probably an area for social dialogue at the highest level, as the tools to deal with this type of situation, should it occur, would be largely of a macroeconomic nature and related to expansionary policies of demand management and working time reduction. Nevertheless, there is also room for social dialogue at the level of the firm regarding the reduction of the implications of downsizing, through early retirement. For example, in September 2019 the Spanish ICT

Table 4.2 Potential role of social dialogue in addressing the labour market challenges of the Digital Revolution

Potential impact	Possible policy tools	
	Higher than firm level	Firm level
Change in total employment demand	Social dialogue at the highest level (national/EU) => Social pacts Effective demand management and social policies Reduction in working hours	Early retirement Reduction in working hours
Change in employment structure	Training and recycling programmes Social dialogue at the highest level (national/EU) => Social pacts (for example, wage complements)	Training and lifelong learning policies Early retirement
New skills and skills obsolescence	Training and recycling programmes	Training and lifelong learning policies
New/revival of old types of labour relations	Social dialogue at the highest level (national/EU/global) Sectoral collective bargaining Develop collective bargaining in new business models	Firm level collective bargaining (for example, limits to new forms of labour contracts) Develop collective bargaining in new business models
New health and safety issues	Social dialogue at the highest level (national/EU/global) Sectoral collective bargaining	Firm level collective bargaining

company Telefonica announced its intention to reduce its labour force by a fifth (around 5000 workers), along the same lines as the previous 2016 plan involving the individual suspension of employment that affected another 6000 workers. This reduction in employment, part of a firm collective agreement, is partially driven by the change from analogue to digital technologies (together with the increase in competition in the sector, which was once a monopoly).

Social dialogue at the firm level and at sectoral or national levels has an important role to play in reducing the potential negative impact of changes of the employment structure owing to technical change. In this instance, the development of new skills and the recycling of employees would facilitate the transition of displaced workers from low-labour demand to high-labour demand sectors of activity. Training has been a traditional area for social dialogue, and in many countries social partners play an institutional role in the design of training policies. As stated in a joint document of the European Social Partners¹⁰ (German Economic Institute 2018, p. 3), ‘Social dialogue and collective agreements, in particular at the sectoral level, play an important role in the governance of training systems and in creating training opportunities and improving the relevance and provision of employee training’.

As regards the growth of non-standard employment relations, both firm-level and sectoral collective bargaining can be used to discuss the recourse to these forms of employment (including plans for their transformation into standard employment relations if

considered convenient). However, discussions at a higher level will also probably be needed in order to elucidate whether new forms of employment relations are needed (such as economically dependent self-employment developed in some countries, such as Spain or Italy). Collective bargaining, or other types of social dialogue, could also be extended to the new business model – the platform – which is currently characterized by low participation in employers' associations and low affiliation rates. In this regard, the ILO Global Commission on the Future of Work recommends 'the development of an international governance system for digital labour platforms that sets and requires platforms (and their clients) to respect certain minimum rights and protections' (ILO 2019, p. 44).

Finally, social dialogue at both national and lower levels, together with OSH regulation at EU and national levels, looks like a suitable arena for discussing new OSH issues and prevention (Eurofound 2012; Jain and Leka 2012).

3. RESPONSE OF THE SOCIAL PARTNERS

After reviewing the potential implications of the Digital Revolution for labour markets and labour relations, in this section we analyse how the social partners of EU member states are dealing with these challenges. With that aim, we first study the social partners' awareness of the challenges ahead and their main concerns. Against that background, the following section reviews the extent to which social dialogue at the EU and national levels addresses different aspects of the Digital Revolution, and how they deal with them.

3.1 Level of Awareness and Concern across EU Member States

The recent European Trade Union Institute (ETUI) survey of digitalization¹¹ is a useful starting point for identifying the level of concern and involvement of EU trade unions regarding the labour market implications of the Digital Revolution. At this stage, two elements of the survey can shed light on the concerns and level of involvement of trade unions regarding the Digital Revolution and its management. In relation to the first issue, the survey respondents considered that the Digital Revolution entails both opportunities and risks. Among the opportunities (Figure 4.4a) those who were interviewed highlighted the creation of new STEM-related jobs, working time reductions, more work autonomy, better ergonomics and new forms of collaboration between workers and machines. Among the risks (Figure 4.4b), the destruction of jobs was rated most important, at 52 per cent, well above the other risks mentioned, namely, the weakening of workers' representation and erosion of collective bargaining (31 per cent) and extension of working hours (30 per cent). In this regard, it is interesting to note how, in the opinion of those surveyed, the Digital Revolution can have both positive and negative impacts on employment: it can be a new source of jobs but also a cause of the destruction of jobs, while there is a promise of working-time reduction but also the risk of boundless work demands. The same applies to autonomy as, according to the workers, new technologies offer both the possibility of increasing autonomy and the risk of higher dependence. This is important as it implies that the net result could be dependent on the measures taken

Source: ETUC (2018, pp. 1–14).

Figure 4.4 Risk and opportunity related to the Digital Revolution (first two most important) (percentage)

by the social partners, among others, to guide the Digital Revolution in one direction or another.

Turning to the second question, the involvement of trade unions in initiatives related to the Digital Revolution, such as Industry 4.0 or digital agendas, whether public or at the level of the employers, more than half of respondents considered the trade union role as important in only two countries, Sweden and Germany. In Spain, Denmark, the Czech Republic and Belgium, respondents considered that trade unions were only one among

many of the stakeholders consulted. At the other end of the spectrum, in France and Italy the feeling was that trade unions were not involved at all. This country distribution is also found when asking about the role of trade unions in initiatives and policies fostering digital skills and lifelong learning: only in Sweden, Germany and Denmark did more than half consider that trade unions were involved in these initiatives. In Italy and France the percentage of those who considered that trade unions play an important role in this area was below 20 per cent (ETUC 2018, p. 17).

Unfortunately, there is no equivalent survey information on the position of employees regarding the awareness and concerns of EU employers. As regards concerns, and focusing on those items related to the labour market, a 2015 BusinessEurope policy paper shows that firms and workers share some of the above-mentioned concerns.

There are also opportunities for workers, such as more autonomy and flexibility in work organization, more possibilities to balance work and private life, more learning opportunities, as well as access to more potential work opportunities. Some existing jobs and areas of activity will evolve; some jobs will disappear, but new activities will appear, leading to overall employment gains. (BusinessEurope 2015, p. 5)

In this context of rapid change, the key challenge from the firms' side is 'to adapt EU and national skills policies to better meet the rapidly evolving labour market needs generated by the digital economy' (BusinessEurope 2015, p. 5), as well as to facilitate the 'increased work flexibility required by digital industries', considered to be 'essential' (BusinessEurope 2015, p. 9). In a different area, but also with employment implications, BusinessEurope (2014, pp. 3, 15) shows concern for the need to create a level playing-field in taxes and regulation so that both traditional and digital firms are treated equally.

From a different perspective, but also related to the firm side, the CEC European Managers 2018 survey,¹² addressed to European managers, also sheds light on the concerns of the managers of European firms regarding digital transformation. According to the survey, slightly over a quarter of respondents consulted with workers' representatives in order to implement digital technologies, while around 50 per cent provided training with that aim. The survey also covers the drivers behind the introduction of digital technologies, with increasing competition at the top (60 per cent) and staff cuts at the bottom (20 per cent), although managers consider that they have been less successful in the former than in the latter. Finally, the introduction of digital technologies had a positive impact on some aspects of working conditions, such as training or the introduction of flexible work, but also contributed to the deterioration of others, such as stress, work-life balance or information overload. As regards the ethical implications of digital technologies, almost half the managers surveyed showed concern about the implications for privacy of digital technologies, followed by transparency and labour rights (23 per cent).

3.2 The Presence of Issues Related to Digitalization in Social Dialogue at Different Levels

This section explores the extent to which firms' and worker organizations' concerns about the future of work and employment have been translated into actions through social dialogue. We first review the experiences of social dialogue in this field at EU level and then at the level of the member states.

Before starting, it is important to highlight, once again, the huge diversity of EU member states as regards both their level of economic development and their economic structure and introduction of digital technologies. To give an example of these differences, Figure 4.5 reproduces two of the sub-indexes of the Digital Economy and Society Index (DESI) of the European Commission (2018a): the Business Digitalization Index and the E-Commerce Index that form the Integration of Digital Technology dimension.¹³ Although this index only touches on some of the items related to digitalization, such as the importance of e-commerce for SMEs and the use of social media, e-invoices or cloud solutions, the results, in relation to the incidence of digital technologies in national firms, are revealing, with the country with the highest value, Ireland (68.7), registering a value almost four times higher than the value registered by the country with the poorest result, Bulgaria (18.1).

Other complementary information, such as the use of robots, buttresses this conclusion. According to the World Industrial Robots Survey (International Federation of Robotics 2017), in 2016, there were around 1300 robots per 10 000 workers in Germany or France, while in Poland there were only around 200 per 10 000 workers (International Federation of Robotics 2017).

This diversity of penetration of the Digital Revolution, partly explained, in the case of robots, by countries' economic structure – most robots are used in the automobile sector – would explain how concerns about digitalization among the social partners, as well as the actions taken to manage it, vary nationally. This diversity permeates public opinion; for example, in relation to the labour market impact of digital technologies. In this regard, according to Eurobarometer (2017), while 90 per cent of people in Spain and Portugal agree (totally, or tend to agree) that robots and AI steal people's jobs, in

Source: EC, Digital Scoreboard.

Figure 4.5 Integration of digital technology by sub-dimension, EU, 2019

the Scandinavian countries the percentage is around 53–60 per cent (the EU average is 72 per cent).

As consequence, the importance of the issues related to the management of the Digital Revolution for social partners and social dialogue differ substantially across EU member states (and industries).

3.2.1 Social dialogue at EU level

As Table 4.3 shows, in the past decade the social partners have produced a variety of statements on digitization's impact on the economy, both at the level of specific sectors, such as chemicals, pulp and paper or banking, and at cross-industry level. As regards the latter, in March 2016 the ETUC, BusinessEurope, CEEP and UEAPME¹⁴ produced a 'Statement of the European Social Partners on digitalization' that stresses how job creation in the context of the digitalization of the economy 'will depend on how successfully

Table 4.3 Documents on digitalization and new technologies adopted by the European social partners, 2010–19

Sector	Title	Date
Insurance	Follow-up statement on the social effects of digitalization	15/02/2019
Banking	Joint declaration on the impact of digitalization on employment	30/11/2018
Pulp and paper	Social partner resolution addressing the ongoing digitalization in the European pulp and paper sector and its potential impact on industry and employment	06/07/2018
Commerce	European agreement on guidelines on teleworking and ICT-mobile workers	25/05/2018
Metal	The impact of digitalization on the world of work in the metal, engineering and technology-based industries	08/12/2016
Chemicals	Joint position on social and employment aspects of digitalization	22/11/2016
Insurance	Joint declaration on the social effects of digitalization by the European social partners in the insurance sector	12/10/2016
Cross-industry	Statement of the European social partners on digitalization	16/03/2016
Local and regional government	Joint declaration on the opportunities and challenges of digitalization in local and regional administration	11/12/2015
Telecommunications	Joint UNI Europa and ETNO declaration on future ICT skills needs	28/11/2014
Postal services	Joint declaration on matching skills and jobs in the European postal sector	21/11/2014
Commerce	Common contribution of the social partners in commerce to some flagship initiatives of 'EU 2020: a European strategy for a smart, sustainable and inclusive growth'	04/08/2010

Note: Uni Europa – the European Service Workers Unions; ETNO – European Telecommunication Network Operators' Association.

Source: 2010–17, European Commission (2018a, p. 155); 2018–19, Social dialogue text database, DG EMPL, accessed 16 March 2020 at <https://ec.europa.eu/social/main.jsp?langId=en&catId=521>.

European enterprises adapt to technological developments, and on the extent to which the EU will be able to create a favourable policy and regulatory environment to safeguard the interests of enterprises and working people at the same time'.¹⁵ It calls on public authorities and social partners at various levels 'to assess how best to adapt skills policies, labour market regulations and institutions, as well as work organization and information, consultation and participation procedures, in order to derive maximum benefits for all from the digital transformation'.¹⁶ The European Social Dialogue Work Programme 2019–2021 (BusinessEurope et al. 2019) includes digitalization as one of the six work lines aimed at improving knowledge, given that 'many aspects of the ongoing digitalization process are not yet clear or understood'. The aim is to negotiate an autonomous framework agreement on digitalization (European Social Dialogue Work Program 2019–2021).

Although there are some earlier examples of bipartite statements from the social partners dealing with digitalization, from 2016 onwards various sectors produced their own texts regarding the impact of digitalization on their economic activities. In 2016, for example, the insurance sector, in the 'Joint declaration on the social effects of digitalisation' (AMICE et al. 2016), presented what they termed the 'Principles of the social design of digitalisation', focusing on, among others things:

1. The convenience of using existing labour and social law as a (good) basis for the digitalized working world.
2. The recognition of training as the key element in successfully addressing the challenges that lie ahead, as digitalization requires 'new skills and competences on the part of both employers and employees' (AMICE et al. 2016, p. 3).
3. New issues regarding work–life balance will arise as digitalization influences customer behaviour (24/7 availability). Attention should be paid to preventing 'counterproductive forms of work-related stress due to digital availability', while at the same time addressing the 'growing phenomenon of performing work/services outside business hours' (AMICE et al. 2016, p. 4).
4. In order to deal in a social way with digital restructuring, 'companies should consider doing their utmost to avoid, reduce and mitigate redundancies' (AMICE et al. 2016, p. 4).
5. Digitalization also poses challenges to employee representatives, which should be tackled with an open mind.

Three years later, the signatories, in a follow up to the 2016 declaration, emphasized training, especially for workers whose function is likely to disappear, in order to initiate, if necessary, 'individual qualification programmes and guidance' (AMICE et al. 2019, p. 1). Attention is also paid to the 'absolutely imperative that the social partners monitor working time limits in a modern way and in line with applicable legislation and collective agreements', as the increase in autonomy of employees regarding when and how long to work, although positive for job quality, might increase psychosocial risks, such as burnout, if not adequately managed (AMICE et al. 2019, p. 2).

It is interesting that, regardless of the sector of activity, most of the statements mentioned in Table 4.3 share the same concerns: new training needs and work–life balance,

for example, highlighting the convenience of dealing with such issues in the context of social dialogue at different levels. According to the statement of the banking sector of 2018: 'social dialogue is key in order to shape the digital transformation of the banking sector' (EBF-BCESA and Uni Europa 2018, p. 3).

There are other examples of agreements of different types between the social partners at European level on other issues related to the digital transformation of the economy. To name one, in May 2018 Uni-Europa, the European service workers union, and Euro Commerce, representing national federations and companies in the retail, wholesale and international trade sector from 31 European countries, signed a European Agreement on Guidelines on Teleworking and ICT-Mobile Work (T/ICTM) in Commerce, aimed at updating the pioneering agreement on the same subject of 2001, to be used as guidelines for introducing and implementing T/ICTM. This agreement stresses the importance of guaranteeing that social contacts with the workplace and fellow workers is not lost, and the need to ensure that the introduction of T/ICTM is transparent, respecting existing information and consultation procedures.

Interestingly, a G7 Social Tripartite Declaration was adopted in June 2019. In reference to the Future of Work, the G7 members and international social partners (International Trade Union Confederation, International Trade Union Confederation, Trade Union Advisory Committee of the OECD, and Business at OECD) recognized the need to work together

towards the adoption of effective strategies and appropriate policy responses to promote enabling environments for job creation and decent work, economic and sustainable growth as well as equal opportunities and reduced inequalities ... To that end, we will work to achieve effective responses to shape the future of work we want, improve the functioning of labour markets, with a specific emphasis on tripartism and social dialogue. (G7 Social Ministers' Meeting 2019, p. 2)

3.2.2 Social dialogue regarding digitalization at country level

Regardless of the existence of social dialogue at EU level, which can provide the context for more specific agreements at national and subnational levels and at firm level, most social partner actions in relation to digitalization have taken place at member-state level. This is owing to the huge diversity of employment regulations and labour market characteristics in the member states, their 'employment regimes' (Gallie 2007).

The social partners have been involved in many different national initiatives (15 according to the European Platform of National Initiatives on Digitizing European Industry; European Commission 2018b) aimed at contributing to the digitalization of European industry – including Germany's Industrie 4.0, Spain's Industria Conectada 4.0 and the Dutch and Swedish Smart Industry¹⁷ – although these forums go beyond the traditional social dialogue and involve many other stakeholders besides employers' organizations and trade unions.

Turning to the traditional arena of social dialogue, Table 4.4 presents digitalization issues that have been addressed in various ways (in the context of trade unions, through information and consultation or at sectoral or firm-level collective agreements), according to the ETUC 2018 survey.

Note that, first, many of the topics mentioned have not been addressed by trade unions. The high percentage of negative answers regarding the representation of new

Table 4.4 Topics addressed within your workers' representation body or organization

	% of overall response*				
	No	Yes, within union organization	Yes, information and consultation	Yes, company agreement	Yes, sectoral collective agreement
Business strategy					
Change in the business model/strategy of the company/sector owing to digitalization	21	26	34	10	2
Outsourcing and offshoring of work/tasks to online platforms	40	16	22	8	1
New technologies					
Introduction of new digital technologies, e.g. automation, robots, digital devices such as handhelds, tablets, data glasses, smart gloves, etc.	24	19	32	15	2
Changes in work organization and work processes linked to the application of digital technologies	20	21	37	14	2
Working time					
Work-life balance or working time issues related to digitalization	30	21	21	11	4
Training and qualification					
Telework and ICT mobile work	28	15	21	22	5
Right to disconnect	41	19	15	8	2
Changes in occupational profiles and qualification	28	18	28	8	3
Further training and acquisition of new skills through digitalization of production or service	29	19	29	8	3

Table 4.4 (continued)

	% of overall response*				
	No	Yes, within union organization	Yes, information and consultation	Yes, company agreement	Yes, sectoral collective agreement
Data protection	32	14	23	17	1
Health and safety	23	19	23	19	2
Representation of new types of workers in the digital economy	26	21	28	11	5
	43	23	12	4	1

Note: * Share of respondents indicating 'don't know' (6–17 per cent) is not included.

Source: ETUC (2018, p. 23).

workers related to the Digital Revolution (freelancers, dependent self-employed and subcontracted workers) is especially striking. Second, information and consultation, a less intensive form of social dialogue, is the mechanism most widely used to deal with these issues. As highlighted by ETUC (2018), this is a particular cause for concern as the survey sample is likely to be biased towards large companies, in which workers' representation still exists. The second most widely used mechanism for dealing with these issues is the firm-level collective agreement, mentioned by 12 per cent of respondents. The percentage is larger (over one-third) regarding changes in organization resulting from the introduction of new (including digital) technologies, followed by training and health and safety issues (in nearly 30 per cent of cases). Working time issues have been addressed in around 20 per cent of cases. In contrast, only 2.5 per cent of respondents mention sectoral collective agreements as the mechanism used to address these issues. This reliance on firm-level agreements is logical, as decisions about the introduction of new technology are taken at that level. According to the EMP 2018 survey, however, both firms and sectors are affected by the same issues, so bargaining at sectoral level could make sense, too.

In order to illustrate in greater detail the coordinates of the debate and the type of agreements reached by social dialogue at country level, we next review some country experiences using different sources of information, among them the results of an ongoing cross-country project (2018–20) Diresoc, financed by the European Commission (EC), focused on digitalization and social dialogue. In view of the ongoing nature of the Digital Revolution, it is beyond the scope of this chapter to present a complete analysis of the role of social dialogue in the process of introduction of these new technologies and organization-related changes. Instead we give a general idea of what is being achieved across different sectors and EU countries.

The right of French workers to disconnect addressed by the El Khomri Act, named after the Minister of Labour at the time, is a good example of the interplay between regulation and social dialogue in dealing with new challenges to working conditions posed by the Digital Revolution. Among the many aspects of labour relations covered by the law, most aimed to deregulate the French labour market, 'Loi no. 2016-1088 du 8 août 2016 relative au travail, à la modernisation du dialogue social et à la sécurisation des parcours professionnels' ('Law no. 2016-1088 of 8 August 2016 relating to work, the modernization of social dialogue and the securing of professional careers') included an article (Article 55) introducing the 'right to disconnect' from work calls and emails during non-working hours. Nevertheless, the specific regulation of this right was left to the social partners, with the provision that if no agreement was reached, the firm could unilaterally implement its rules. This initiative has been followed by many other countries (such as Italy and Spain) and territories (such as New York City). In Spain, the procedure followed is different, being included in the Protection of Personal Data and Guarantee of Digital Rights Act.¹⁸ This law also addresses the right to intimacy and use of digital devices at work, recognizing the right of workers' representatives to participate in the development of regulations on the use of digital control devices.

Continuing with the French case, Teissier (2018, p. 37) argued that the usual tools and practices of social dialogue are still valid: 'if you need to cut jobs, you'll have to discuss a social plan or whatever, digitalization or not', although the new challenges 'might justify

the setting up of new areas, tools and processes, i.e. to “enrich social dialogue”, some of which are already running (such as the sectoral skills and employment observatory or the Employment and Expertise Plans, GPEC).

In Spain, technical change and digitalization has a small presence in collective agreements. According to the Statistics on Collective Agreements, in 2016 only a small number of collective agreements had clauses on Digital Revolution issues. For example, in 2016, only 3 per cent of collective agreements (2.42 per cent of employees covered by collective agreements) included agreements on telework, while only 2.9 per cent (4 per cent of the relevant employees) dealt with the adoption of new technologies. In both instances, these issues are dealt with mainly in collective agreements at the firm level. From a temporal perspective, it is interesting to note that the share of collective agreements dealing with such issues has decreased since the Great Recession, from a maximum of 8.5 per cent in 2008 to 4 per cent in 2016.¹⁹ According to Rocha and de la Fuente (2018), the meagre – almost irrelevant, in their opinion – role of tripartite social dialogue in digitalization is explained by the stalemate that emerged during the long and deep economic crisis of 2009–13 and by the government’s preference for public consultation instead of the traditional social dialogue when dealing with the Digital Revolution. The political paralysis produced by three general elections from 2015 to 2019 also explains the lack of advance of social dialogue at tripartite level, the weak spot of the nascent process of digitalization in Spain, according to the main Spanish trade union CC.OO. (Fundación 1º de Mayo/CC.OO Industria 2018). In the few cases in which social dialogue deals with issues related to the Digital Revolution, Rocha and De la Fuente (2018) observe that digitalization is often brought to the bargaining table *ex post*, in order to deal with the consequences of technical change, and not *ex ante*, developing anticipatory measures. Moreover, in a landscape dominated by micro firms, with very few medium-sized and large companies, Spain suffers from a relatively low level of innovation (according to the European Innovation Scoreboard, Spain is in the group of moderate innovation countries, along with Italy, Cyprus or Portugal). The authors highlight how the emerging collective agreements addressing digitalization belong mainly to multinational corporations operating in highly competitive global sectors. Nevertheless, things seem to be moving, albeit slowly. One example is the 2018 national agreement of the hospitality industry, signed by the two main Spanish trade unions, which explicitly includes delivery of food and drinks, including those coordinated through digital platforms (Rocha 2019).

In Italy, there are also important differences between sectors, owing to the existence of strong territorial and socio-economic dualisms. According to Leonardi and Di Nunzio (2018), the main concerns among social partners regarding the Digital Revolution, in line with the results of Table 4.4, are the occupational impact in relation to job destruction and employment shifts, investments in Industry 4.0, the legal status of platform digital workers, individual and collective rights and protections, and the effects of the new ICT on workers’ privacy. The existing system of industrial relations (strong social partner representativeness and intensive social dialogue) has been fundamental in coping with digital-related restructuring, especially in sectors with effective communication channels and high affiliation rates, such as banking or the postal system. Nevertheless, as in Spain, the response has been mainly reactive and *ex post*, not proactive and *ex ante*, looking at mitigating the structural impact of digitalization in both sectors. In banking,

which is highly exposed to digitalization (automated teller machines and Internet banking), but also highly unionized, technological redundancies have been dealt with by early retirement schemes, while the last National Sectoral Collective Agreement introduced training rights for workers (albeit a meagre 24 hours over three years). Postal services (which have been strongly affected by the Digital Revolution through, for example, the substitution of regular mail by e-mail) also offers a good example of the role played by social dialogue in digital transformation. According to EC data, between 2004 and 2011, in Italy, letter mail decreased by 28 per cent, while from 2012 to 2017 domestic postal traffic, letter mail and parcel services decreased by 34.5 per cent.²⁰ The 2017 national agreement aimed, among other things, at ‘joint management between the social partners of the social consequences of the implementation of the reorganization and/or restructuring and/or transformation processes that have effects on working conditions, including collective mobility’. The agreement included the creation of a Post Group Committee (trade union and company) to study technological innovation with a potential impact on business and competitiveness (Article 5). In this regard, the trade union played an important role in reducing the closure of postal offices from 500 to 200 (Leonardi and Di Nunzio 2018).

Italy is also among the first countries in which a territorial collective agreement was signed by institutional trade unions, workers’ autonomous collectives and the management of a platform firm, the food-delivery company Snam-MyMenu, setting a fixed hourly rate in line with the sector’s minimum wage, compensation for overtime, holidays, bad weather and bicycle maintenance compensation (Aloisi 2019, p. 2). In May 2019, another food delivery firm, Laconsegna, signed a collective agreement with Filt Cgil, Fit Cisl and Uiltrasporti, which included the consideration of riders as employees covered by the collective agreement of the logistics sector. Furthermore, a works council was created, the first in Italy at a platform firm (Daugareilh et al. 2019, p. 72).

Sweden should be especially well prepared to deal with the impact of the Digital Revolution owing to its well-established system of collective bargaining and high (if decreasing) affiliation rates. According to Anxo (2019, p. 399), ‘the Swedish model of industrial relations relies on powerful, independent and all-encompassing employer’s and workers’ organizations’, which should facilitate a smooth transition for workers affected by the digital transformation (OECD 2018, p. 15). According to Bergström and Ismail (2019), LO, the Swedish trade union confederation, has traditionally favoured technical and structural change as a way to guarantee the high productivity that will allow good working conditions. In this regard, digitalization is not considered new, but business as usual. Conflict between the social partners arises from the implications of technical change in the era of digitalization. While trade unions focus on the growth of new forms of non-standard and precarious employment, employers argue that digitalization provides a rationale for changes in labour regulation. In contrast, both parties agree on the need to improve and reform the Swedish education system in order to better adapt to the new needs and further develop lifelong learning (Bergström and Ismail 2019).

Sweden also offers interesting examples of the extension of collective agreements to the platform economy. An example is the agreement signed by Bzzt (a platform of personal transport by tuk tuk), which allows Bzzt drivers – hired on marginal part time contract – to be covered by the Taxi agreement (Swedish Transport Workers’ Union).

Another example is the agreement signed between Instajobs (a platform for student work) and Unionen, by which Instajobs workers are covered by the collective agreement for temporary agency workers. The same option has been followed by Gigstr (low-skilled gigs) (Jesnes et al. 2019). In this regard, an economist working at Unionen (Söderqvist 2017) proposed a platform institution aimed at creating digital standards for the platform economy. Standards would be agreed in negotiations between platform firms, trade unions and the relevant government agencies, and would serve as guidelines for platform firms.

The use of existing collective agreement provisions in discussions on algorithm-based management practices or ethical aspects of the implementation of occupational safety-related tracking devices is an example of the versatility of Swedish social dialogue for addressing the challenges of digitalization (Söderqvist and Bernhardt 2019).

In 2012 Portugal adopted a Digital Agenda, which has subsequently been updated through various initiatives, including:

1. Estratégia TIC 2020, aimed at the digital transformation of public administration.
2. INCoDe.2030, an integrated public policy initiative aimed at improving digital competences, including *AI Portugal 2030*, aimed at scaling up 'public and private investments' to allow 'state-of-the-art AI applications into the market so that the economy and the public sector can use the foreseeable benefits of AI' (INCoDe.2030 2019, p. 17); and
3. Indústria 4.0, the Portuguese strategy to develop industry in the digital domain.

According to the available information, there has been no direct social partner involvement in the design or follow up of these programmes (Gasparri and Tassinari 2017). As regards Indústria 4.0, the Portuguese trade union Fiequimetal, the metalworkers' federation of the largest confederation, Confederação Geral dos Trabalhadores Portugueses – Intersindical Nacional (CGTP-IN), has criticized the lack of union involvement (Gasparri and Tassinari 2017).

As regards Digital Revolution issues in collective bargaining, Rego's (2018) analysis, based on the collective bargaining reports of the Centro de Relações Laborais, identified ten collective agreements between 2016 and 2018 that included some type of technological topics, such as the promotion of training to facilitate technological adaptation. Furthermore, the potential implications of the Digital Revolution are not considered in the 2018 tripartite agreement 'Combater a precariedade e reduzir a segmentação laboral e promover um maior dinamismo da negociação coletiva' ('Fighting precariousness and reducing labour segmentation and fostering more active collective bargaining') signed on June 2018, which includes only references to the need to 'modernize and dematerialize', creating a web portal as the default mechanism of communication with citizens and firms for the Autoridade para as Condições de Trabalho (Labour Inspectorate).

In the United Kingdom, the Trades Union Congress laments, in a 2015 paper (TUC 2017), the current low levels of government and business investment that might jeopardize the future United Kingdom role in the coming digital economy and demanding a strategy of worker consultation (at both national and workplace levels) to shape the future of digitalization. Also highlighted in the document are the need to overhaul investment in training:

All workers should have access to a mid-life training review to assess their skills, and despite their chequered history, government will need to reintroduce individual learning accounts to give everyone a personalized budget for training [and to] ensure that if the productivity benefits from new technology do show up, the rewards are fairly shared. (TUC 2017, p. 7)²¹

However, the relatively low rate of collective agreement coverage, 26 per cent of employees and 14.7 per cent²² of private sector employees in 2018, implies that in the private sector by far the most common way of fixing pay and working conditions is unilateral management decision (even if filtered by the labour market situation). In the public sector, pay is usually set through nationally negotiated collective agreement. The affiliation rate in the public sector is 52.5 per cent compared with 13.2 per cent in the private sector.

A good example of the marginal role played by social dialogue in implementation of the Digital Revolution is the 2017 'UK Digital Strategy',²³ in which, to the best of our knowledge, there is no reference to the role of the social partners. Although social dialogue has been successful in areas such as the establishment of the Low Pay Commission and the Women and Work Commission or in the improvement of training by firms (Broughton 2008), it does not seem that the road to a digital economy in the United Kingdom is going to be guided by social dialogue.

As in other countries, trade unions and employers' associations, in this case the GMB union and the Confederation of British Industry (CBI), maintain conflicting views regarding some of the effects of digitalization. While a GMB report indicated the poor working conditions of many precarious workers, the CBI described the United Kingdom's flexible labour market as an invaluable asset (Evans 2017).

Paradoxically, considering the low coverage of collective agreements in the private sector, in February 2019 the United Kingdom joined Italy and Denmark in the avant-garde of platform worker bargaining with the signing of an agreement by Hermes, a courier company, with the GMB. The agreement included holiday pay and minimum wages and provided union recognition for gig workers. It is important to note that this agreement came after Hermes courier workers won the right to be considered 'workers' at an employment tribunal.²⁴

In Germany, the publication in 2015 by the Federal Ministry of Labour and Social Affairs of the green paper 'Working 4.0: thinking further about work', produced a debate among the social partners in different position papers. For example, Gesamtmetall (the employers' association for metal and electrical engineering) did not consider it necessary to increase data protection and codetermination rights, while the BDA (Confederation of Employers' Associations) emphasized the need to ensure that the new technology is not accompanied by more bureaucracy. In contrast, the DGB (Confederation of German Trade Unions) argued in favour of setting new rules for the new types of employment relations that could flourish with the new digital economy, such as platform work (Eurofound, 2017). In the White Paper, 'Arbeit 4.0', published the following year, the Ministry argued in favour of drafting a new law (Working Time Choice Act, *Wahlarbeitszeitgesetz*), which would combine greater choice for workers in relation to working time and location, with a conditional possibility to derogate certain provisions of the Working Time Act (*Arbeitszeitgesetz*) on the basis of a collective agreement between the social partners with implementation at firm level. The

acknowledgement that the Digital Revolution will go beyond Industry 4.0, together with the potential profound implications of new employment relations, for example, related to platforms, make it advisable, according to the report, to strengthen collective bargaining in the services and care sectors, a process that could ‘eventually lead to a generally binding collective agreement for the social sector’ (Federal Ministry of Labour and Social Affairs 2017, pp. 10–11).²⁵ Other issues covered by the report are increasing employee data protection and studying whether new forms of employment related to crowd working might need regulation, taking ‘the long-standing, tried-and-tested regulations for home workers’ (Federal Ministry of Labour and Social Affairs 2017, p. 12) as a model.

Looking at the practice of social dialogue in relation to digitalization, it is worth mentioning two conclusions reached by Mühge (2018) after studying this issue in tourism, finance, postal service/logistics and industry. The first conclusion is that the impact of digitalization and the role played by social dialogue in the different sectors are diverse (high in finance and logistics, and low in tourism). The second is that, also with sectoral differences, ‘an increase in the importance of employee participation is observed’ (Mühge 2018, p. 23). This increase, nevertheless, has led to a growing tension between increasing demands and insufficient resources among works councils, as well as a lack of support: ‘It is the unanimous opinion of interviewees and experts that digitalization is exacerbating the burden on works councils’ (Mühge 2018, p. 23).²⁶

In Finland, in a context in which public opinion is relatively optimistic about the future implications of the Digital Revolution (Pulkka 2019), labour market organizations, including the Central Organization of Finnish Trade Unions (SA), the Confederation of Finnish industries (EKK) and the Office for the Government as Employer (VTML), in 2019 agreed on joint principles concerning digitalization and AI. The endorsed document, ‘Digitalising Finland is an opportunity: a big leap forward in employee wellbeing and in labour productivity’, emphasizes the importance of broadening workers’ skill sets in order to make it easier to adapt to changes of occupation in a context of employer–employee collaboration: ‘It is desirable that management and employees together see what future work skills are needed and that workplaces together seek ways to acquire these skills.’²⁷

The programme²⁸ of the newly elected coalition government (five parties) of 2019 includes, in its labour market section, the objective (objective 3) of ‘stability and trust in the labour market through collective bargaining’. This objective considers measures such as:

1. studying the need for changes in legislation from the perspective of the transformation of work (entrepreneurs and self-employed, the sharing and platform economy, new forms of commissioning work and cooperatives), including the amendment of the Employment Contract Act, if necessary, to prevent employment from arising under the guise of other contractual relationships;
2. anticipation of structural change, especially due to technological advances and climate change; and
3. development of a multiannual national development programme for work and wellbeing at work to accelerate the renewal of modes of operation and the use of new technology.

The high affiliation rates and collective agreement coverage, as well as its level of insertion in the digital economy makes Denmark another interesting country as regards how the Digital Revolution is affecting the world of work. In 2017, the Danish government established the Disruption Council. It is headed by the prime minister and comprises seven ministers and 29 members, including chief executive officers (CEOs), social partners, academics and others, and its mandate is to discuss ‘the best course for Denmark to navigate into the future’ (Danish Government 2019, p. 6). Among its concerns regarding labour market policies, the Disruption Council highlights:

1. the need to strengthen the Danish adult and continuing training system and lifelong learning;
2. the need to monitor developments in the area of platform work to ensure that the government and social partners find the proper solutions within the framework of the Danish model (see below); and
3. the risk of greater social division. This risk, so far, has been confronted by the government by entering into a tripartite agreement with the social partners (2017) on an improved and more flexible adult and continuing training system, the simplification of employment rules and the creation of a new unemployment benefit system for self-employed persons and atypical workers, harmonizing, to a great extent, the rules governing them with those governing regular employees.

In this context of intense social dialogue, Denmark is credited with the first collective agreement between a platform company, Hilfr (which provides cleaning services for around 1700 customers across Denmark), and (via the Confederation of Danish Industry) the largest Danish trade union, 3F. Under the agreement, there is a minimum wage of 141 kroner (about €19 in August 2018), workers are entitled to contributions to pensions, holiday pay and sickness benefits (Eurofound 2019). The importance of this agreement, according to Tina Møller Madsen, leader of 3F Services and chief negotiator with Hilfr, is that ‘with this collective agreement we are bridging the “Danish labour market model” and new digital platforms; by doing so we are offering initial answers to one of the major issues of our time: how to reap the benefits of new technology without undermining labour rights and proper working conditions’.²⁹ A novel feature of this collective agreement is that it introduces a new category of workers, the Super Hilfrs, the default option for those workers who meet certain conditions (100 hours of work).

A casual review of Danish collective agreements shows that the implications of technological change are not unusual items in collective agreements. For example, agreements for the meat industry, between the Danish Food and Allied Workers’ Union, NNF, and the Confederation of Danish Industry, DI, include various technological agreements and a general agreement by which the ‘parties agree to work towards ensuring that the current employees will be used for the operation of new technology. In support of this, the provision on systematic training planning of the training protocol may be applied’.³⁰

As we can see in Table 4.5, which collects examples of intervention of social partners dealing with the effects of the digital revolution at different levels of social dialogue, the overview of country cases conducted in these pages shows that the social partners are both aware of the potential, and uncertain, implications of the Digital Revolution

Table 4.5 *Examples of social dialogue at different levels dealing with new technologies and the digital revolution in six European countries*

Country	Level			
	National	Sectoral	Regional	Enterprise
Belgium	National Collective Agreement on protection of employee's private lives No. 81 (2002) protects private lives of employees with respect to controls on electronic online communications data	Finance sector: Protocol on 'talent mobility': Pathways for workers whose jobs may be under threat due to digital transformation. Those who commit to a pathway will benefit from the help of coaches, who have been trained on the problems affecting the sector, as well as a 'Talent Mobility' digital platform		
Denmark	2017 tripartite agreement on improved and more flexible adult and continuing training system	Agreements for the meat industry on specific technological agreements and a general agreement on the use by employees of new technology in exchange of systematic training		Collective agreement at the platform cleaning services company Hilfr on minimum wage, contributions to pensions savings, holiday pay and sickness benefits of platform workers
Finland	2019 agreement on joint principles of digitalization and AI, aimed at broadening workers' skills to changes in occupation etc.			

Italy

2017 National agreement in the postal sector to reduce employment reduction through mobility etc.
Agreement in the sector of Logistics
Electric power sector: Individual right to training, which amounts to 28 hours per employee over three years

Territorial CA signed by institutional trade unions, workers' autonomous collectives and the management of a platform firm, the food-delivery company Sgnam-MyMenu

Laconsegna CA which includes the consideration of riders as employees covered by the collective agreement of the logistics sector
Lamborghini: Commitment to establish a bilateral commission with the purpose of negotiating the issue of 'Big Data availability', which consists of assessing to whom the data produced by the company's IT systems will be available – the workers or the company only.

Portugal

Inclusion of clauses regarding training for better adaptation to digital transformation and professional retraining (*Reconversão profissional*) in different firms e.g.: 'Acordo de empresa entre a Caima – Indústria de Celulose, SA e FIEQUIMETAL e outros' or 'Acordo de empresa entre a Portway – Handling de Portugal, SA e o Sindicato Democrático dos Trabalhadores dos Aeroportos e Aviação – SINDAV'

Table 4.5 (continued)

Country	Level			
	National	Sectoral	Regional	Enterprise
Spain		XIX Collective Agreement of the chemical industry (2018–2020) regarding the assessment of occupational risk related to the introduction of new technologies, <i>ex ante</i> information when the introduction of new technologies is expected to produce substantial changes in working conditions or a technical training	Collective agreement for HORECA of the province of Segovia (2018–2021) including right of information regarding the introduction of new technology: “The introduction of new technologies should not lead to the reduction of employment” (art. 33). With that aim training or reallocation of the worker should be provided	Different CAs dealing with training for Industry 4.0 (XIX Collective Agreement of Seat SA, 2016–2020); right to disconnect (IX Framework Agreement of Repsol Group, 2017–2019; Philips Ibérica, 2018–2020; AXA 2017–2020), telework (AXA 2017–2020); right to information on new technologies (Renault Spain, 2017–20); etc.
Sweden	Tripartite industrial dialogue on digitalization (2016), restructuring and matching (2017) or new technologies (2018), concerned with general strategies, in the form of exchanges of opinions			Agreement signed by Bzzt (a platform of personal transport by tuk tuk), which allows Bzzt drivers to be covered by the Taxi agreement (Swedish Transport Workers’ Union). Other examples are Instajobs (platform for student work), Gigstr (low-skilled gigs)

Source: Based on references cited in the chapter, EurWork (Eurofound) and Planet Labor.

and, albeit unevenly among countries, have taken them into account in their daily work. As mentioned in the minutes of a TUAC (the trade union advisory committee to the OECD) meeting held in Paris on Digitalization and the Digital Economy (OECD 2017b), trade union activities regarding digitalization include: the use of collective agreements to monitor the introduction of new digital technologies; monitoring compliance with labour standards in the context of rapid changes in the world of work; extending their activities to new groups of workers such as self-employed and platform workers; participating in training schemes to facilitate stability of employment in a word of rapid change of jobs and tasks within and between firms; and participating in advisory groups on digital innovation at different levels.

These activities are carried out using the standard tools of social dialogue, but also new digital tools. In section 4 we reflect on how these new digital tools are changing the way trade unions work.

3.2.3 A note on artificial intelligence and social dialogue

Although we are very far from a fully developed AI (Craglia et al. 2018; Fjelland 2020), owing to the gargantuan potential of AI to change the future of work (among other ways by pushing further out the frontier of automation and through the development of new forms of surveillance at work) the social partners are starting to discuss what the appropriate approach could be to the management of AI in production systems.

For example, a July 2020 ETUC ‘Resolution on the European strategies on artificial intelligence and data’ stresses the need to ‘remain active in the societal debate on AI to make it compatible with the objectives of social Europe, decent work and social progress’ (ETUC 2020, p. 3). In this, the ETUC considers that because the availability of large quantities of data is the backbone of the application of AI to production, the EU’s current General Data Protection Regulation (GDPR) does not adequately protect workers from the downsides of AI technologies, such as work-related stress and excessive pressure from intensive work schedules defined by AI. Among other things (such as the need to ensure data governance and the security of data storage and access), the ETUC argues for free access to the source code of AI systems before they are implemented in the workplace in order to be able to test the compliance of algorithms ‘with the rule of law and fundamental rights’ (ETUC 2020, p. 3).

These demands coincide with the OECD’s Recommendation of the Council on Artificial Intelligence (OECD 2019b), specifically with its item 1.3 on transparency and explainability, which stresses the importance of making ‘stakeholders aware of their interactions with AI systems, including in the workplace’, enabling ‘those adversely affected by an AI system to challenge its outcome based on plain and easy-to-understand information on the factors, and the logic that served as the basis for the prediction, recommendation or decision’. As with other technological innovations related to the Digital Revolution, the OECD also recommends steps to build human capacity and prepare for the labour market transformation in different ways, ‘including through social dialogue, to ensure a fair transition for workers as AI is deployed, such as through training programmes throughout working life, support for those affected by displacement, and access to new opportunities in the labour market’ (OECD 2019b, item 2.5).

The position of BusinessEurope regarding AI is summarized in a position paper adopted in July 2019 (BusinessEurope 2019). The paper highlights the need to have a coherent legal

framework and a robust infrastructure, as well as ‘a highly educated and entrepreneurial workforce’. Regarding the impact of AI on employment, the document adopts a fairly optimistic perspective in which AI is considered a tool to ‘assist our workforce rather than entirely replace it, enabling the human element of work to be improved’ (BusinessEurope 2019, item 9). BusinessEurope also suggests a cost sharing approach to re-skilling and upskilling, in which the EU would sponsor and support the required training programmes, while their coordination would remain the ‘sole task of the Social Partners’ (BusinessEurope 2019, item 41), ensuring a good match between supply and demand.

A paper by UNI Europa ICTS (2019, p. 4), the European trade union federation representing telecom workers, also emphasizes the crucial role of social dialogue in the management of AI: ‘Without social dialogue, we cannot build the best strategy for AI’. This paper is especially relevant for the purpose of this review as it presents the concerns and guidelines for collective bargaining in three areas related to AI: data collection and management, skills and training, and a fair and just transition. Focusing on the former for the sake of brevity, the union includes the following among its guidelines for negotiating workers’ role in data management: (1) justification and prior consultation before the introduction of any method for managing worker-generated data; (2) information about data control and access (subject to workers’ consent); (3) the right to decide what happens to data collected by the employer (digital legacy); (4) redistribution of benefits derived from the use of the data collected when used, sold or licensed to a third party; (5) transparency in the use of personal data; (6) traceability; (7) risk assessment of the implications of adopting AI by the firm in terms of personal rights, working conditions or other social consequences; and (8) evaluation of AI, based on predefined criteria (UNI Europa ICTS 2019, p. 9).

This set of recommendations regarding worker representatives’ involvement in AI deployment is in line with the principle of human agency and oversight underlined by the High-Level Expert Group on AI (2019, p. 15), according to which ‘AI systems should support human autonomy and decision-making’, and the ‘Human-in-command’ approach to AI, advocated by the European Economic and Social Committee’s (2017) opinion on artificial intelligence, by which machines must remain machines and people must retain control over these machines at all times.

4. CHALLENGES AND OPPORTUNITIES OF THE NEW DIGITAL TECHNOLOGIES FOR TRADE UNIONS AND EMPLOYERS’ ORGANIZATIONS: NEW TOOLS FOR NEW TIMES

Together with the transformations of the world of work reviewed in section 2 of this chapter, the Digital Revolution is also affecting the way the social partners, especially trade unions, perform their mission and relate to their constituencies, as the composition of the labour force changes and new ways of doing and communicating things develop. This section focuses not on the labour market and labour relations impact of digitalization, but on its effects on the social partners themselves. This includes the extent to which the Digital Revolution will have, or is already having, an impact on the way the social partners themselves work.

Following Ward and Lusoni (2002), the ICT and Digital Revolution could lead to three different scenarios regarding trade unions. The first would be a future of erosion owing to: (1) the growth of sectors or types of employment with traditionally lower affiliation rates, (2) the development of an individualistic culture, inclined toward individual bargaining of working conditions, and (3) an inability to adopt new technologies and social media in their daily work, and benefit from what Bennett and Segerber (2012) call ‘connective action’, along with traditional collective action.

The second scenario is modernization, as new ICT technologies could contribute to updating trade union bureaucracy, allowing the development of online custom-made services and professional assistance (Diamond and Freeman 2002), better targeting and recruiting of members, and a modernization of the trade unions’ public image.

The third scenario would be the democratization of trade unions, as new digital technologies allow the use of new tools for members’ participation in decisions and debates, in what Diamond and Freeman (2002) term cyber-democracy, opening up trade unions to a wider audience.

Interestingly, there is very little literature on this issue in relation to employers’ associations. This is also applies to many other social dialogue issues. What literature there is on the future of social dialogue on the company side briefly touches on the unwillingness of new digital firms to join traditional employers’ associations. According to a recent report (Kilhoffer et al. 2017, p. 31), ‘none of the evidence surveyed indicates that platforms are organizing into employer associations or being incorporated into existing employer associations’. According to Kiess (2019), Germany-based platforms do not seem to be particularly interested in entering into traditional industrial relations. This should come as no surprise, as platforms do not consider themselves to be employers.³¹

The three scenarios reviewed above have items in common, namely, the need to adopt new ways of mobilizing workers, to reach areas of employment now on the fringes of trade unions, such as temporary employees and younger workers,³² to incorporate the communication possibilities offered by social media, and to benefit from big data, as digital companies do, to improve their services and reach.

In this regard, Pasquier and Wood (2018) argue that trade unions can use the new tools supplied by the Digital Revolution to reach out to new groups of workers and develop new forms of action. For example, social media can amplify traditional offline collective action (the cyber-dispute hypothesis of Diamond and Freeman 2002). The World Wide Web, and social media in general, is becoming an important space for industrial disputes, enhancing the legitimacy of campaigns by highlighting workers’ personal testimonies, connecting the movement with activist networks and supporting the emergence of new forms of collective action. The potentialities of digital technologies to connect to workers outside traditional workplaces is also highlighted by the ILO (2019, p. 59).

The Internet can also be used to develop new virtual spaces, where workers can discuss issues in a bottom-up manner, Worknets, and informal real-time social dialogue, Social Digilogue, to use the European Commission’s neologism (2019, p. 40).

Other interesting avenues for the future are the use of the information that trade unions have on affiliates and firms to do a type of predictive unionism (Maxwell 2018). Based on data-mining of members, firms and other sources, trade unions could offer tailored information about fair wages to their members (controlling for characteristics), underpayment, and so on. A pioneering example of this predictive unionism is the work

of Fredrik Söderqvist, a trade union researcher in Unionen, a Swedish trade union with nearly 650 000 members (10 per cent of Sweden's working-age population) who is working on an algorithm based on the gargantuan individual and aggregate data available to the trade union to extract patterns to improve bargaining outcomes.

Trade unions are also opening up to new working environments, such as platforms and solo self-employment. In some instances, as exemplified by the Spanish UGT, the first step is to research the working conditions of platform workers (UGT 2019). According to the UGT, union involvement in the area was a response to the numerous queries regarding platform work made to a digital platform (www.turespuestasindical.es, accessed 8 March 2020) developed in 2017 as a tool for contacting platform workers and supplying legal advice. The other main Spanish trade union, CC.OO, is also involved in the fight for recognition of platform workers at firms such as Deliveroo and Glovo as employees, instead of own-account workers. It has developed another webpage, <https://precaritywar.es/> as a communication and complaints tool.

Other strategies include the legal backing offered by some trade unions to platform workers, notably riders, in their legal disputes (for example, the IWGB and Deliveroo riders), the integration of groups of platform workers in trade unions, as in the Netherlands or the United Kingdom, or cooperation between trade unions worldwide to promote good practices in platform work (Rocha 2019).

One important example of this last strategy is the Fair Crowd Work joint project of IG Metall (the German Metalworkers' Union), the Austrian Chamber of Labour, the Austrian Trade Union Confederation and the Swedish white-collar union Unionen, in association with research and development partners Encountering Tech and M&L Communication Marketing. Fair Crowd Work gathers information, based on surveys of workers, about crowd work, app-based work and other platform-based work, from the perspective of workers and unions. The information is then used to generate ratings of the working conditions of different online labour platforms.³³

This strategy can be accompanied by the development of a code of conduct for crowdsourcing platforms, as the Ombudsman for German Crowdsourcing Platforms established in 2017 with eight European crowdsourcing platforms, the German Crowdsourcing Association (Deutscher Crowdsourcing Verband) and the German Metalworkers' Union (IG Metall), tasked with resolving disputes between crowdworkers, clients and crowdsourcing platforms, as well as with overseeing enforcement of the Crowdsourcing Code of Conduct adopted by the platforms. These moves could eventually end up in the establishment of works councils, as occurred with the Foodora riders in Vienna.³⁴ The Austrian social partners have also agreed the first collective agreement for bicycle couriers, including workers working for traditional companies and platforms, but excluding those working as independent contractors.³⁵

5. CONCLUSIONS

Our review of the challenges to social dialogue posed by the Digital Revolution, and social partners' response to them, leaves many uncertainties but has also established some facts. Starting with the former, and always from a positive perspective – it is vital to know what we do not know – our review of the implications of the Digital Revolution

for labour and the labour market, in section 2, indicates many potential impacts of digitalization on work, in different directions, which could lead to totally different scenarios concerning the future of labour.

Regardless of the numerous prophecies of the end of work, there seems to be a growing consensus among the social partners that the new digital technologies, at least in the short and medium terms, will have more impact on the type of employment generated than on its level. This highlights the importance of providing workers with the skills they need to adapt to the new labour demands. As with other issues, the existing consensus regarding the importance of training, upskilling and recycling throughout working life starts to unravel when it comes to deciding who should pay for these growing training needs: firms, the public sector or employees. This issue is especially thorny when, owing to the uncertainty surrounding technical change, the most efficient form of training may well be the improvement of general skills and competences, not firm-specific training.

The growth of non-standard employment is another potential impact of the Digital Revolution. However, it is important to acknowledge that non-standard employment relations were already increasing, although the reduction of transaction costs related to cheap access to growing amounts of data and processing make this type of employment viable in new areas of economic activity. The social partners' acknowledgement of the social and economic implications of these new forms of jobs has led, once again, to a variety of positions: the need to adapt to the new realities of work, on the firms' side, expanding the traditional forms of social protection to the new groups of workers, versus the need to enforce current labour legislation in order to eliminate the loopholes that favour the growth of non-standard relations, on the trade unions' side.

Finally, new technologies will contribute to the reduction of some health and safety risks but will also generate new risks that will have to be addressed by governments and social partners. The new challenge will be more closely related to psychosocial risks than to physical risks. The current health and economic crisis caused to the Covid-19 pandemic has highlighted a number of vulnerabilities among some categories of workers, in particular gig workers.

Social dialogue has a say in the management of all these changes, albeit at different levels. In some instances, such as growing technical unemployment, tripartite social dialogue at national or even European level would be the proper avenue. In others, such as training, health and safety or new employment relations, social dialogue at national level (both sectoral and firm levels) seems more appropriate.

This social dialogue will require capable and knowledgeable social partners, hence the imperative of changing the trend of falling affiliation rates faced by trade unions in many countries. In relation to this, the Digital Revolution and its ubiquitous social media could act as a potential agent of change for trade unions, opening up new channels of communication with workers who, owing to the temporary nature of their employment or the digital nature of their work, are now more isolated from fellow workers than in the past. The new participation tools facilitated by the digital technologies could also contribute to the democratization of trade unions and enhancing their representativeness.³⁶

The contingent and casual review of their activities carried out by social partners in relation to the implications of the Digital Revolution for the world of work shows both their concerns and their involvement in addressing many of the previously mentioned

challenges. The intensity of approaches differs across the EU member states, as does the level of penetration of the Digital Revolution in their societies. The implications of the new technologies for training and employment levels, together with working time, data protection and health and safety issues, exist at different levels of bargaining, from statements and agreements at EU level to firm-level or sectoral agreements. Again, for trade unions used to dealing with new technologies, in sectors such as manufacturing or banking, this is business as usual, although in many countries, reactive measures ('what do we do now?') tend to have priority compared with proactive measures.

Making use of the informal clustering of EU member states by union and employment density and CA coverage rate proposed in Chapter 2 of this volume, it is in the clusters formed by (1) countries in which union and employment density and high coverage rates go hand in hand (mainly the Nordic countries plus Belgium) and (2) countries with low union density but relatively high employer density and coverage rate (for example, Austria, France, Germany, Spain and Italy) where we can find more issues related to the Digital Revolution at different levels of social dialogue. By contrast, social dialogue around issues related to the Digital Revolution is less common in the other two clusters (the Baltic countries, Central and Eastern countries, the United Kingdom, Ireland and Greece) and Portugal and Slovenia.

We are also witnessing moves in different areas aimed at reproducing something akin to firm or worker bargaining among groups, such as own-account workers and platform workers, which so far have lacked any mechanism of workers' representation. It is too early to know whether these moves will end up replicating the traditional form of works council and collective agreement, or whether new forms of bargaining and representation will be developed.

The Covid-19 pandemic, and the measures taken in response to it, have substantial and diverse implications for the digital economy. On one hand, measures such as social distancing and lockdown have given an unexpected boost to teleworking, one of the pioneering forms of work organization made possible by computers and the Internet. Home working increased enormously across the EU almost from one week to the next. Suddenly, all activities that could be performed that way were shifted from offices, schools or universities, to students' and employees' homes. It is too early to obtain a clear picture of the implications for productivity and working conditions³⁷ of this gargantuan shift. It is also too early to assess the extent to which this shift will produce a permanent change in what previously had been a very unequal and uneven resort to teleworking across EU member states (in the country with the highest share of workers usually working from home, Finland, only 14 per cent of workers were usually teleworking, compared with an EU average of 6 per cent),³⁸ but this natural experiment has shown the feasibility of increasing telework. According to a recent survey conducted by Eurofound (2020), 37 per cent of EU workers have begun to switch to telework because of the pandemic, and almost 60 per cent in Finland.

However, it must be acknowledged that telework is not the panacea that many once thought. Not only are there problems with broadband, hardware and software capacity, as well as training, but also a large proportion of jobs are not suitable for telework. Furthermore, telework viability varies considerably, depending on each country's economic structure. For example, a recent estimate for the United States by Dingel and Neiman (2020) sets at 34 per cent the share of jobs that could plausibly be performed at

home. According to the sectoral classification carried out by Fana et al. (2020) regarding the impact of the Covid lockdown measures, 25 per cent of jobs in the EU are in sectors that partly or entirely operate via telework, with larger shares in countries such as Luxemburg and Sweden. These differences partly explain the asymmetrical economic impact of the Covid-19 crisis in the EU.

The Covid-19 crisis has also highlighted the low (often non-existent) level of social protection for gig workers. According to FairWork (2020), around half of all workers in the gig economy worldwide have lost their employment because the platforms they work for have suspended activities, while for the rest their incomes have fallen to around one-third of previous earnings.³⁹ Moreover, even workers in sectors unaffected (or enjoying an increase in demand) by the lockdown, such as food, parcel and grocery deliveries, have experienced increases in their exposure to risk from contagion. The platforms have not always responded adequately to this, for example, in the provision of personal protective equipment.

NOTES

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1. It is important to highlight that this technological enthusiasm does not fit well with the relatively slow rate of introduction of new technologies by firms, and the correlative increase in productivity. According to a recent World Economic Forum report: 'While several pioneering companies and early adopters praise technology's positive impact, adoption remains slow and limited across all industry sectors. More than 70% of industrial companies are still either at the start of the journey or unable to go beyond the pilot stage ... stuck in "pilot purgatory"' (WEF 2018, p. 4).
2. For a comparative analysis of the different estimates see ADB (2018), Arntz et al. (2019) or Valenduc and Vendramin (2019).
3. The OECD classification includes basic content skills – reading comprehension, active listening, writing, speaking, mathematics skills and science – and basics process skills – critical thinking, active learning, learning strategies and monitoring.
4. Operations analysis, technology design, equipment selection, installation, programming, operation monitoring, operation and control, equipment maintenance, troubleshooting, repairing, and quality control analysis.
5. Eurostat, 'Digital skills of the EU labour force, 2017' (percentage of individuals, by skills level) (isoc_sk_dskl_i, accessed 28 June 2021).
6. The overall cost, defined as the sum of the direct cost (cost of providing training) and indirect cost (earnings forgone during training, assuming that workers do not work during training) would be considerably higher (ranging from 0.38 per cent to 1.56 per cent in the Slovak Republic), except in the case of unemployed workers, when the indirect cost would be zero (OECD 2019a, p. 114).
7. Eurofound (2018b) has identified ten types of platform work according to the scale of tasks, the type of service provision (online or locally delivered), the level of skills required, the client-worker matching process and the system of work allocation.
8. Defined as those who earn 50 per cent or more of their income via platforms and/or work more than 20 hours a week via platforms.
9. See ETUC Resolution, 'Defining quality work: an ETUC action plan for more and better jobs', adopted 13–14 December 2017 by the ETUC Executive Committee.
10. BusinessEurope, the European Centre of Employers and Enterprises (CEEP), the European Association of Craft, Small and Medium-Sized Enterprises (UEAPME) and ETUC.
11. The ETUC online survey on Fair Digitalisation and Workers Participation was run in 2017/18 and obtained more than 1,500 responses from trade unionists and company level workers' representatives from more than 30 European countries, including from EWCs and SE works councils in more than 220 transnational companies (ETUC 2018).

12. The CEC European Managers survey 2018 is a non-representative survey of 1400 affiliated and non-affiliated managers within the framework of the European Managers Panel.
13. The Business Digitisation Index includes the following variables (as a percentage of firms using): (a) electronic information sharing, (b) radio frequency identification (RFID), (c) social media, (d) e-invoices and (e) cloud solutions. The e-commerce index includes the following variables (as a percentage of SMEs): (a) selling online, (b) e-commerce turnover as a percentage of total turnover of SMEs, and (c) selling online cross-border. The Business Digitisation Index captures the dimension Integration of Digital Technology, while the E-Commerce Index accounts for the other 40 per cent. Together with these two sub-dimensions, the DESI includes four other dimensions: connectivity – broadband market developments in the EU; human capital – digital inclusion and skills; use of internet services by citizens, and digital public services.
14. Since 2018, SMEunited (UEAPME) has been the association of crafts and SMEs in Europe, with around 70 member organizations from over 30 European countries, CEEP is the European Centre of Enterprises with Public Participation and of Enterprises of General Economic Interest, and can be considered the public sector counterpart of BusinessEurope, the main European-level social partner organisation, representing private employers of all sizes through its national member federations. The ETUC, the European Trade Union Confederation, is recognized by the EU as the only representative cross-sectoral trade union organization at European level.
15. 'Tripartite Social Summit – 16 March 2016, statement of the European Social Partners on digitalisation', p. 1, accessed 1 July 2021 at https://www.busineurope.eu/sites/buseur/files/media/position_papers/social/2016-03-16_tss_-_statement_on_digitalisation.pdf.
16. Ibid.
17. See Vogel (2017) for an account of the Czech Republic, Denmark, Germany, Italy and Spain.
18. Ley Orgánica 3/2018 de 5 de diciembre de Protección de datos personales y garantía de los derechos digitales, art. 88, Right to digital disconnection in the labour context, to be developed by collective bargaining.
19. Author's analysis from *Estadística de Convenios Colectivos*, several years.
20. European Commission, 'Historical postal data from 2004 until 2011', GROWTH Internal Market, Industry, Entrepreneurship and SMEs, Postal Services.
21. Other issues covered include consideration of a policy of working time reductions should technological unemployment happen, bringing forward an increase in the state pension age to 68, and the need to keep watch on other aspects of new technology, such as the rise in surveillance at work or working conditions in platform companies.
22. 'Trade union membership statistics', 2018, Department for Business, Energy & Industrial Strategy, UK Government.
23. An overarching document setting out 'how we will build on our success to date to develop a world-leading digital economy that works for everyone' (<https://www.gov.uk/government/publications/uk-digital-strategy>, accessed 30 May 2021).
24. 'Hermes to offer gig economy drivers better rights under union deal', *Guardian*, 4 February 2019.
25. The report makes a strong defence of social dialogue:

To achieve new flexibility compromises, we should examine further incentives and instruments to support social partnership, collective bargaining coverage and the establishment of works councils. Rather than simply seeking to slow the erosion of collective bargaining coverage and staff representation, which has been evident over recent decades, we should endeavour to reverse this trend. (Federal Ministry of Labour and Social Affairs 2017, p. 13)

26. For more examples of firm-level collective agreements regarding digitalization see section 5 of Chapter 5 in this volume.
27. Accessed 26 July 2021 at <https://www.sak.fi/sites/default/files/attachments/central-labour-market-organisations-joint-principles-of-digitalisation-and-ai.pdf>.
28. Inclusive and competent Finland – a socially, economically and ecologically sustainable society (accessed 1 July 2021 at <https://julkaisut.valtioneuvosto.fi/handle/10024/161845>).
29. 'World's first collective agreement between platform company and trade union in Denmark', Thursday 20 September 2018, UNI Europa global union.
30. Extract from pp. 71–2. Similar agreements can be found in many other collective agreements in different sectors, such as banking: 'Where the introduction of new technology leads to job losses, the Group must always endeavour to offer the affected employees another job. The joint consultation committee must in general discuss education and training, as well as deployment, retraining or other employment for employees affected by the changes' (Collective agreement for the Danske Bank Group, 1 April 2014–31 March 2017, pp. 118–19).

31. On the other side, traditional firms tend to consider platforms to be competitors, and not always fair competitors, owing to their ability to avoid the non-labour wage costs and other costs that they must face. There is no evidence of established employer associations inviting platforms to join them (Kilhoffer et al. 2017).
32. For the OECD, the affiliation rate of temporary employees is 9 per cent, less than half the affiliation rate of employees with open-ended contracts. Young employees (aged 15–24) have an affiliation rate of 7 per cent, compared with 22 per cent of workers aged 22–64 (OECD 2017a). Nevertheless, according to the OECD (2019), these differences are largely explained by the characteristics of employment (for example, employment in a sector with lower trade union presence and non-standard employment relations), and not by a lower trust in trade unions or different values among younger people (OECD 2019, box 5.1).
33. The 95-question survey covers eight different areas: (1) basic demographics (for example, age, location and gender), (2) general experiences as a platform worker, including hours worked per week, and history of crowd working, (3) pay and non-payment, (4) communication with clients, platform operators and other workers, (5) reviews, ratings, and evaluation of workers and clients, (6) experiences with platform technology (for example, ease of use and reliability of app or website), (7) quality, character, and availability of tasks and (8) general likes and dislikes with respect to their work (Platform Review Information, <http://faircrowd.work/platform-reviews>, accessed 22 March 2020).
34. Supported by the Austrian transport and services union Vida, bicycle couriers working for the platform food delivery service Foodora in Vienna founded a works council in April 2017.
35. Together with the standard clauses in relation to wages and working time, the agreement includes an extra payment of €0.14 per kilometre for workers using their own bicycles and equipment (Eurofound, 'Platform economy repository, initiatives', accessed 26 July 2021 at <https://www.eurofound.europa.eu/es/data/platform-economy/initiatives>).
36. According to G. Kelly, in the *Financial Times*: 'No one really knows exactly what an enterprising 21st-century unionism could look like. But it is a safe bet that it would need to be low cost and as digitally savvy as the other services on which young workers rely in other parts of their lives' ('Trade unions – adapt to the modern world or die', *Financial Times*, 1 June 2017).
37. For example, according to Eurofound (2020) a significant share of teleworkers, 27 per cent, report working in their free time. Furthermore, this full immersion in telework has also shown that initial hopes that it could foster a better work–life balance have been dashed, as 22 per cent of persons living with children under 12 report difficulties in concentrating on their jobs, compared with less than 5 per cent in households with no children.
38. If we look at the share of workers who sometimes work from home the percentage rises to 31 per cent (in the case of Sweden), with an EU average of 11 per cent (Eurostat, EU-LFS 2019).
39. For example, US drivers working for platforms such as Uber and Lyft have reported a 65 per cent drop in their incomes.

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