

Strengthening social regulation in the digital economy: Comparative findings from the ICT industry

Virginia Doellgast, ILR School – Cornell University

vld7@cornell.edu

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Abstract

National economies with different industrial relations and welfare state traditions are experiencing a similar digital transformation. This article examines how labour unions are seeking to influence digital strategies and investments in the information and communication technology (ICT) industry, based on initial research findings in the US and Germany. These efforts can be divided into three action fields: campaigns focused on influencing state investment and data protection or AI regulation; efforts to extend legal or negotiated labour market protections to new groups of workers; and collective negotiations over new technologies at firm and workplace levels. All three can be seen as complementary in establishing the conditions for the social regulation of new digitally-enabled markets.

Introduction

National economies with different industrial relations and welfare state traditions are experiencing a similar digital transformation. Cloud computing has dramatically expanded remote data storage capacity; while internet speeds are increasing via fiber optic broadband networks and 5G (Boes and Langes, 2019). Advances in artificial intelligence (AI) are enabling new forms of automation in manufacturing (associated with AI-enabled robots and smart machines); and in services (via robotic process automation and algorithmic management) (Haenlein and Kaplan, 2019). These AI-based tools can lead to massive downsizing in certain areas, but also enable new models of monitoring, work organization, and performance management (Wood, 2021). The combination of a shift of platforms ‘to the cloud’ and advances in AI have increased firms’ capacity to gather and analyse huge amounts of data (‘big data’) from customers, employees, and the public; as well as to organize work remotely -- e.g.

through app-based work, the human cloud, or COVID-induced proliferation of work from home arrangements.

Firms in the information and communication technology (ICT) industry are on the forefront of these developments – responsible for building and maintaining networks and data storage infrastructure; selling and servicing ICT products to private customers; and developing and selling new AI- and cloud-based tools to businesses. Their employees are the target of frequent technology-enabled restructuring, and their models to both organize work and to make profits are being widely copied in other industries. Thus, developments in the regulation of work and employment in this sector are increasingly central to understanding the future direction of capitalist economies.

This article asks how labour unions and works councils are trying to influence the strategies of ICT firms to adopt and deploy new technologies. Findings are based on preliminary research findings from an international research project on technological change and job quality in four North American and European countries. The analysis presented here draws on around 60 interviews in the US and Germany with union and employer association representatives in the ICT industry, union and works council representatives and managers at ICT firms, and software developers and consultants; as well as research on general trends in the industry through ICT industry publications and attendance at online industry conferences. It is intended as an overview and initial discussion of current developments, based on a keynote presentation at the 2022 AIRAANZ conference in Sydney, Australia.

The article is structured as follows. The first section summarizes recent developments in digitalization and AI in the ICT industry. The second discusses the implications of technological change for work and employment. The third section compares union and works council responses in the US and Germany, describing three action fields: campaigns focused on influencing state investment and data protection or AI regulation; efforts to extend legal or negotiated labour market protections to new groups of workers; and collective negotiations over new technologies at firm and workplace level. The article concludes with a discussion of implications for comparative employment relations research and practice.

Digitalization and AI in the ICT industry

The ICT industry is at the center of the digital economy, and so developments in this sector provide a useful window on how digitalization and AI are transforming work and employment more broadly. One challenge is defining the industry itself. According to the OECD, the ICT sector ‘combines manufacturing and services industries whose products primarily fulfill or enable the function of information processing and communication by electronic means, including transmission and display’ (OECD, 2022). However, there are many distinct industry segments that fall within this definition, including traditional telecom companies like AT&T, Deutsche Telekom, and Telstra that own and operate fixed and wireless networks; IT services firms that provide consultancy or support like IBM or Atos; hyperscalers that sell cloud, networking, and data storage services like Google Cloud and Amazon Web Services; firms that manufacture ICT hardware, like Apple and Samsung; and those that develop ‘software as a service’ (including AI-based applications), like Microsoft and Oracle. Increasingly, firms compete across several of these segments and rely on long-term partnerships to develop infrastructure and deploy new technologies.

In the course of my research, I have attended ICT industry conferences and carried out interviews with consultants and employer representatives – which has given me a broad sense of the important developments from the perspective of industry leaders, as of 2021-22. Several trends stand out. First, telecoms are investing in high speed 5G and fiber broadband networks, which allow different AI-based tools to be accessed and processed more quickly. This has been given a boost by the COVID-19 pandemic and network demands associated with the shift to work from home, including government subsidies for or direct investments in network construction and upgrading in many countries. Second, data centers are necessary to expand data storage and support cloud computing; and the location of and control over these centers has become increasingly strategically important. Data centers can also be huge and use large amounts of energy. Clients are thus increasingly concerned with both environmental sustainability and control over the security of their companies' and customers' data. Digital or data sovereignty has also become an important issue -- particularly in Europe, due to the combination of stronger European data protection rules and geopolitical concerns. Partnerships focus on creating different combinations of multi-cloud, hybrid cloud, and sovereign cloud solutions that allow scalability while ensuring protection of and control over sensitive data.

This shift to cloud computing has been part of a move across industries toward 'software as a service' and 'infrastructure as a service' – software, infrastructure, and data storage are licensed as a subscription and centrally hosted on remote cloud servers. Because this is a growth area, telecom companies are rebuilding their own internal IT departments (which many outsourced in the 2000s – see, e.g. Grimshaw and Miozzo (2006)) so they can sell these services to other businesses through 'in-depth integration' of 5G with emerging information technology. One way in which telecom operators hope to 'monetize' or realize profits from investments in 5G is through network slicing – in which they can charge customers different rates depending on the performance of the parts or slices of the network they access. Put simply, customers pay extra for increased bandwidth and higher internet speeds.

All of these investments are expensive and also create new complexity. To deal with both, telecom companies are trying to automate network maintenance and customer service. And they are partnering with hyperscalers and IT services firms to apply data analytics tools for new commercial or organizational purposes. There is a lot of discussion in the industry about, on the one hand, how to 'monetize data' from customers; but on the other hand, how to protect that data from abuse and create ethical models of AI governance – in part to convince governments and the public that firms are capable of regulating themselves in these sensitive areas.

Industry leaders generally share a vision of an increasingly integrated ICT industry that facilitates the digital transition of a wide range of manufacturing and service sectors, including public services. This is often captured by the word 'smart' (smart cities, smart industry, smart government, smart health, smart homes). Traditional telecom 'communication service providers' will become 'digital service providers', characterized by a replacement of the physical network with cloud native IT production components, operated over autonomous infrastructure combining 5G with AI, and executed through increasingly close partnerships among firms.

Artificial intelligence is anticipated to play a central role in helping to manage this shift, both in operations and in infrastructure. Networks will be increasingly autonomous and 'self-healing', with AI-based automation helping to both reduce the time to fix network faults but also to deal with their increasing scale and complexity. The goal is to move toward fully autonomous networks using closed

loop AI automation, where anomalies can be automatically detected and resolved. Similarly, AI tools will allow customer sales and service to be one stop, in real time, and on demand. The industry's imagined future is one where no customer or business has to deal with the annoyance of the network going down and waiting for a technician to fix the problem or waiting in a queue for a contact center agent to buy or change services. Instead, intelligent automation will move the ICT sector to something like the equivalent of self-driving cars, based on 'zero wait, zero touch, zero trouble'.

Of course, a central value proposition for firms in both ICT and other industries (from household goods to autos and beyond) is the projection that innovations will lead to increased demand for their products and services. On the one hand, individuals will pay to control everything in their lives and work from a smart phone; including paying a premium through 'network slicing' arrangements for faster data speeds. On the other hand, companies will invest to seamlessly connect equipment and locations; monitor faults; and control work autonomously over a 5G-enabled cloud. The data produced from all of these technology-enabled interactions then can be the basis for selling more products and services more effectively to a wider subset of customers (B2C) and businesses (B2B). The idea of 'monetizing customer data' involves collecting and analyzing information on individual behaviors or preferences to either improve a business's own operational efficiency, sales, and customer retention; or selling this data to a third party.

An important question concerns the sustainability of these new, digitally-enabled business models in the ICT industry. Essentially, value is produced through two processes: first, through saving labor costs and improving efficiency through automation – both internally and as tools to sell to other companies; and, second, through encouraging consumers and businesses to buy more digital services (and 'smart' products) over increasingly high speed networks. Huge capital investments are being made based on projected future payoffs. On the surface, this seems to be a recipe for 'bubble and bust' within already debt-laden and ecologically unsustainable economies (see, e.g. Perez, 2003).

At the same time, past experience suggests that the economic and worker impacts of these changes will be shaped by different nationally-specific investment and regulatory decisions and industrial relations institutions. How are new technologies transforming work in the sector, and how are worker organizations responding? Both questions hold the key to understanding what hope there is for at least a more socially sustainable digital future. I will now consider each in turn.

Implications for work and employment

The developments described in the previous section are having far reaching implications for work and employment in the ICT sector. I divide these impacts into three categories: labor replacing, labor controlling, and labor displacing.

Labour replacing. First, the most significant employment impacts are from technologies that automate work – or *labor replacing* innovations. A major focus of automation has been on customer service and back office service work. One set of innovations concerns the adoption of frontline robots, or chatbots and voicebots. The most basic version of these enter into a dialogue with customers using natural language, powered by AI; and can be 'trained' to understand and respond to selected topics over voice channels and through chats. Increasingly, these are able to carry out tasks for customers, such as paying

bills or making changes to their plans. One early example is Vodafone's TOBi, which the company developed as part of its digital transformation in the mid-2010s (Donegan, 2021). Another is Google's Dialogflow, which is sold as part of a package of 'contact center AI' solutions.

Behind frontline robots are different AI-based technologies, which rely on a combination of robotic process automation (RPA) and cognitive automation (CA) (Lacity and Willcocks, 2018). RPA uses rules to process structured data and execute standardized processes, like sending emails and moving information between databases; while CA uses inference-based processes to interpret structured and unstructured data, or to independently recognize connections in large amounts of data. CA-based technology is thus able to support or take over tasks requiring mental perception and skills. Increasingly the two are integrated – so that chatbots, for example, are able to learn from experience to continuously improve the quality of answers. Natural language processing, machine learning, and neural networks together support some degree of 'autonomous learning' – but often there is a process of 'passing' information and tasks between RPA and CA tools.

Similar technologies are used to replace a range of business process tasks like data entry, billing, and accounting work. In one example from 2015, Deutsche Telekom partnered with ALMATO to implement around 400 software bots, or RPA digital robots. The company reported in 2016 that they succeeded in automating more than 40 processes, working across over 30 applications (e.g. email management, SAP, routing and ticketing), to complete 320,000 business transactions a month (Wadlow, 2017). By 2018, DT was using over 1500 of these 'Frontend Assistants' to support 4 million transactions per month, performing tasks like checking connections, entering orders, creating invoices, and processing cancelations (Bormann and Haggemiller, 2019: 21). A related 'Assistenzsystem' uses partial automation to support customer advisors, providing tailor-made suggestions to customer service or sales agents on how to answer a customer request. This means agents often do not have to manually search multiple databases, and can provide answers or make offers more quickly. End-to-End Diagnostics through the 'E2E' system supports employees handling customer calls related to network or service disruptions, using algorithms to lead them through each question to ask and the diagnosis of the problem. These two last examples illustrate the difficulty in drawing a sharp distinction between labour replacing and 'labour enhancing' applications of AI. Most innovations do both: they replace existing tasks or jobs; but are also tools for the remaining workers to carry out their jobs more efficiently or effectively.

The rapidly expanding adoption of this kind of front and back office AI-based automation has several potential employment impacts. First, it can lead to substantial downsizing. For customer service, simple requests are increasingly handled by bots, which also direct customers to self-service channels. Routine jobs or tasks are also cut in back office business services. There are not good estimates of the scale of these impacts. However, I heard in interviews at ICT firms that thousands of jobs were being automated using AI-based technologies. In their case write up of intelligent automation at a 'European Telco's' contact centers, Wilcocks and Hindle (2022) note that the company was 'on path' to meet its target of reducing call volume by 80 percent, it had decreased call handling times by two-thirds, and customer service scores had increased. Interviewees in Germany observed that job losses were often (but not exclusively) concentrated among subcontractors or offshore subsidiaries, where companies had already moved simpler, back office tasks. Bormann and Haggemiller (2019: 21) report, for example, that the Frontend Assistant RPA software bots at Deutsche Telekom were used to automate previously outsourced tasks, with savings of 70-75 percent of costs per minute.

Digitalization and AI also create a range of new jobs, particularly in the short term as firms and governments make huge investments in building fiber and 5G networks, expanding cloud-based infrastructure, and developing and marketing AI-based technologies. However, these jobs often require different skill sets than those in shrinking areas, particularly the higher skilled jobs; and union density tends to be lower. This raises questions (discussed in more detail below) about how unions and works councils will represent and regulate growing and strategically ‘core’ segments in the industry.

A second potential impact of AI-based, labour replacing automation is that the peeling off of simpler work can increase the demands or intensity of remaining jobs – particularly in contact center or customer service roles. As easy customer requests are handled through chatbots or self-service, the calls that make it to agents are likely to take more time and knowledge to resolve. There is also less down-time for employees to carry out follow-up paperwork or to search through databases, as these simpler tasks are increasingly automated. This was a common theme in interviews with union representatives and works councilors, who were seeing higher rates of worker stress with increased complexity and work intensity. It was becoming a particularly steep challenge in negotiations, as well, due to the often unpredictable effects on remaining jobs. For example, if contact center employees were capable of handling a wider range of call types due to new tools, should they receive higher compensation? If the number of simpler calls is shrinking, should targets for average call times be adjusted – and what would the impact be on bonuses? Do internal job descriptions need to change to accommodate this? As discussed below, these kinds of changes in work complexity or content could be opportunities for worker representatives to negotiate new agreements, to invest in worker skills or improve pay and conditions – but they could also contribute to increased work load and burnout.

Labour controlling. A second set of AI technologies can better be described as *labour controlling*, as they use AI-based analytics and algorithms in traditional monitoring or performance management tasks. One important tool in contact centers is speech analytics, which leverages AI to understand, process, and analyze human speech. Agent calls first must be automatically recorded and transcribed, and then AI combs through or mines the transcripts to look for patterns. These patterns can concern agent behavior and dialogue: where they followed the script, where they deviated, or what common mistakes they made. Another set of patterns that are useful to companies concerns the content of customer calls: what kinds of questions were coming in at a particular time, or what were common complaints. This data then can be used for coaching employees, or to spot patterns in customer calls and take quick action to reduce call volume or improve satisfaction.

AI can also be applied in automated coaching, giving employees real time tips or feedback on their performance while they are carrying out their jobs. The company Cogito is a leader in this segment -- it sells its ‘Dialog’ software as an ‘artificial intelligence coaching system for augmenting the emotional intelligence of phone professionals’ (Cogito, 2022). As agents are talking with customers, a screen pops up and tells them that they should speak with more empathy or energy, described as an ‘empathy cue’: for example, ‘let’s use this opportunity to make a connection with the customer’. A related set of technologies combine the use of cameras with visual pattern and facial recognition software to identify anomalies or policy violations in employees’ workspaces – including their homes, where they are in remote working arrangements. The contact center subcontractor Teleperformance, for example, was requiring its employees in some countries to install webcam systems that used AI to regularly scan the workspace and report breaches like unauthorized use of mobile phones to supervisors (Walker, 2021).

These specific tools are part of a broader category of algorithmic management, which can be defined as the use of software algorithms to enable different forms of automated or semi-automated management decision-making (Wood, 2021). Coaching is certainly one important management function that is being supplemented or replaced by algorithms. AI is also used in predictive or ‘human resource’ analytics to hire new workers, determine training needs, and allocate work. For example, predictive behavioral routing in contact centers matches callers with specific requests or even (perhaps more aspirationally) personality patterns to agents who are best able to handle those customers. More conventionally, AI is increasingly used to recognize patterns recorded or gathered via diverse electronic data sources to evaluate performance – for example, through AI-enabled cameras or wearable devices; but also, as described above, through speech analytics. Thus, in addition to being ‘labor controlling’, these tools are also to some extent ‘labor replacing’, as AI is used to automate certain management tasks.

These kinds of technologies raise several concerns from the standpoint of workers and unions. One concern is that they use employee data. Thus, data privacy may be at risk, particularly if there are no guidelines concerning which kinds of employee data the software can access and how it will be used (Ajunwa et al., 2017). As I will discuss below, this has been particularly important in Germany, which has both strong data protection laws and a tradition of co-determination over how performance data is gathered and used. Second, these technologies can encourage intensification of management control. Tools like speech analytics require constant monitoring of employee performance, while AI-based coaching technologies often require employees to follow tight scripts or to receive constant feedback about their performance. Third, these tools can remove certain decisions from humans, so workers have limited ability to complain or contest unfair decisions. At the most extreme, algorithms can be used to automate performance evaluations, training requirements and delivery, work allocation, and hiring and firing decisions. A large body of past research has shown that management practices based on intensive monitoring, restricted control over work, and perceived lack of transparency and fairness in work allocation or performance evaluation decisions are connected to worker stress and burnout (O’Brady and Doellgast, 2021; Pfeffer, 2018). Thus, these tools pose a potential added risk to worker health and well-being – depending on how they are adopted and used.

Labour displacing. Finally, cloud computing and faster data speeds (combined with the expanded use of the AI-based tools described above) have made it easier to relocate a range of ICT jobs. These innovations are thus *labour displacing*. Holtgrewe and Schörpf (2017) describe a process of ‘fine-slicing’ in the ICT sector, where the value chain is split into ever finer modules or sets of activities, with standardized interfaces between modules limiting the need for communication. Increasingly, firms organize even higher skilled programming and engineering work in flexible virtual or remote teams that can combine workers from different firms and/or located in different countries. The most radical version of this is the use of the crowdsourcing or ‘human cloud’ model, through which individuals on freelance contracts bid on projects organized over platforms. IBM announced in 2012 that it would replace thousands of salaried employees in Europe with a network of global freelancers, organized through a network-based tendering system or ‘talent cloud’ (Holtgrewe, 2014: 18) – which Kawalec and Menz (2013) described as part of a tendency toward the ‘liquification’ of work and organization. Contact center jobs can also be organized over freelance, gig-style platforms like Liveops in the US or expertcloud in Germany; enabled by speech analytics and automated coaching tools.

Since COVID-19, the biggest trend has been a massive shift toward ‘work from home’ across the ICT sector. Employees in areas like programming and software engineering, systems analysis and design, or

data analytics were almost universally moved to home office arrangements at the beginning of the pandemic, and many of these were still in place at the time of writing (early 2022). The big telecom companies in the US and Germany moved most of their contact center workers to work from home temporarily and began to hire many new workers onto ‘work from home’ contracts. A German union representative estimated that 80 percent of workers at call center vendors or outsourcers were working from home (interview, 2021). In the vendor segment, with tight profit margins, many physical offices were closed to save costs. These changes also encouraged more intensive investments in AI-based tools, because they supported monitoring and communicating with workers in their homes; as well as organizing more targeted remote training and coaching. The widespread shift to home working arrangements across the ICT sectors (and particularly in its already ‘fine sliced’ networks of subcontractors) may facilitate a further move toward relocating jobs internationally or moving them to freelance contracts.

Responses by worker representatives

Unions and works councils in the ICT sector face similar challenges across countries. First, as discussed above, AI-enabled automation is leading to job cuts, employment restructuring, and changing skill demands – and these are often concentrated in areas where union density has been highest. A second set of issues concerns worker privacy, data protection, discrimination, and ‘control’ by AI or algorithms. Third, worker representatives face the challenge of organizing and representing workers in jobs that are expanding, both in strategically core, higher skilled programming, engineering, and data science jobs and in those organized through more precarious freelance and temporary contracts.

The efforts of labor unions to address these challenges can be divided into three ‘action fields’: campaigns focused on influencing state investment and data protection or AI regulation; efforts to extend legal or negotiated labour market protections to new groups of workers; and collective negotiations at firm and workplace level.

State policy. One set of campaigns focuses on influencing state investment or regulatory policies. Governments are investing in digital infrastructure, and these investments have been accelerated due to the shift to work from home under COVID. In Europe, the EU has a range of initiatives as part of its ‘digital strategy’ to provide funding and technical guidance aimed at improving access to high-speed internet across Europe; while national governments are investing billions in new network construction and access. This provides a potential opportunity for labor unions to put conditions on investments, including greater regulatory oversight of service quality and the working conditions for those workers hired to build or install new network infrastructure. In the US, for example, the 2021 Infrastructure Investment and Jobs Act (IIJA) includes \$65 billion for broadband investment. The final bill included some worker protections sought by the Communications Workers of America (CWA) and other unions, including a preference for companies that have a track record of compliance with labour law and mechanisms to support future compliance. The IIJA required that states individually develop and submit plans outlining the use of these funds for broadband deployment, so CWA activists shifted focus to state level campaigns to include strong labor and quality standards in these plans. The CWA also continued to campaign to pass state-level laws establishing public utility commission oversight of broadband to ensure service quality, consumer protection, and network resiliency (CWA 2021). These laws would be important tools to give workers a seat at the table, encourage upgrading of skills and working conditions, and promote equity in access to digital services as a public good.

Another area of state policy focuses on digital privacy and ethics rules – particularly around the regulation of artificial intelligence and data protection. Bernhardt, Kresge, and Suleiman (2021: 19) argue that these should be seen as part of a broader category of ‘labor standards establishing worker rights and employer responsibilities for the data-driven workplace’. This area of policy innovation has been of concern in both Europe and the US. However, the US is far behind, with a patchwork of national and state-level protections for specific categories of consumer data (Klosowski, 2021), and even weaker privacy protections for workers (Ajunwa et al., 2017).

At EU level, the 2016 General Data Protection Regulation (GDPR) is the most important existing tool, requiring that companies ask for permissions to share data and giving individuals rights to access and delete their data, as well as control how it is used. This applies to workers as well as consumers, and requires, for example, that the processing of ratings and evaluations based on personal data be transparent. The GDPR also recognizes collective agreements as important for ‘processing data rights and governing algorithmic decision-making’ (De Stefano and Taes, 2021: 9). European labor unions have begun using data protection rules to fight against algorithmic discrimination and strengthen platform workers’ rights (Johnston and Silberman, 2020). The GDPR has also been a model for some similar state-level laws in the US, including the California Consumer Privacy Act.

More recently, the European Commission presented a proposal for the EU Regulation on Artificial Intelligence in April 2021, which would ban certain AI systems likely to cause physical or psychological harm; and require providers and users of ‘high risk’ AI systems to follow rules around data governance and human oversight. AI-systems used in employment, management of workers, and access to self-employment are included under the high risk category. But labor unions have been critical of a number of points in the proposal, including allowing companies to regulate their own compliance through self-assessment. The European Trade Union Congress (ETUC) has called for strengthened provisions: for example, to ensure that labor unions are involved in consultation and oversight; to categorize all AI systems used in employment as high-risk; and to ensure the AI Act does not undermine existing national protections (ETUC, 2021). De Stefano and Taes (2021) observe that one risk of the proposed AI Act is to ‘trigger an avalanche of deregulation’ at national level, particularly in those EU countries with more restrictive national legislation requiring union involvement in the introduction of tech-enabled surveillance (for example, Germany).

A particularly important concern in the broader ICT industry is the high degree of concentration and market power held by the so-called ‘Tech Giants’ like Amazon and Google. Attempts to regulate big tech brings together concerns with state regulation of markets and data protection. However, these face strong opposition from industry lobby groups: the ‘big four’ tech companies spent over \$55 million lobbying the US federal government in 2021; while in Europe, 612 ‘companies, groups and business associations lobbying the EU’s digital economy policies’ spent over €97 million annually lobbying EU institutions (Bank et al., 2021). In the US, a number of bills have been introduced in Congress (but not yet passed into law) that would modernize antitrust laws or strengthen liability rules for social media platforms. The EU has had more success: its provisional Digital Markets Act aims to prevent abuse of market power by ‘gatekeepers’ in digital markets through, for example, preventing them from bundling services in one package, combining data from different services without consent, or offering targeted ads across multiple platforms.

The above examples show potential opportunities for unions to influence both investments and ‘rules of the game’ associated with the rapidly changing digital economy. Together, these influence the form that competition takes, as well as more broadly the landscape of resources and constraints firms face as they develop their digitalization and AI strategies. While unions are developing coordinated policy positions and campaigns, they face significant challenges: including from the well-organized and financed lobbying efforts of companies that seek to minimize or shape the terms of these regulations – with a clear preference for self-monitoring. As Rothstein (2021) points out, policy choices are often shaped by ideas about which investments or regulations are most conducive to growth: ‘In the digital transformation, tech and [venture capital] have exercised power by framing economic growth as being driven by financial liberalization via technological innovation.’ ICT companies often frame regulation as a threat to consumers and global competitiveness. Thus, through getting involved in these debates at state, national, and EU level, labor unions often are also fighting an ideological battle – to advance an alternative narrative about the societal and economic advantages of a more ethical, worker-centered approach to investing in and regulating the industry.

Inclusive legal and negotiated labour standards. A second action field focuses on developing more inclusive labour standards, that cover both the core and the periphery of the digital economy. One set of campaigns targets enforcing or extending existing legal and negotiated protections. For example, the global union UNI-ICTS (Information, Communications, and Technology Services), together with national ICT unions, helped expose Google’s violation of legislation in the UK, Europe, and Asia that requires equal pay between temporary and permanent workers carrying out similar jobs or functions (Wong, 2021). A major goal in recent years has been extending employment protections to platform or gig workers, which have typically been considered self-employed or hired on freelance contracts. In the US, much attention has focused on the 2019 California law requiring platforms like Uber to employ their drivers; the successful follow-up ballot measure ‘Proposition 22’ to allow platforms to continue to classify gig workers as independent contractors; and then a court ruling that the ballot initiative was unconstitutional. In Germany, there have also been court rulings and a recent legislative initiative at federal level that should support recognizing a wider range of platform workers as employees (Kormann, 2021). In both countries, unions have taken a leading role in coalitions campaigning for these changes. The European Commission has also proposed a new gig economy directive, which would require platforms to reclassify freelancers as workers across Europe. This overlaps with the above category of data protection and AI regulation, as it would give workers rights to have information on and to challenge automated decision-making through algorithms. The reclassification of platform work would have broader implications for the ICT industry, as a growing number of remote programming and support jobs are organized through crowdwork-style platforms or freelance contracts.

Most basically, unions need to organize the jobs that are growing as others are shrinking. ICT unions are strongest within the traditional telecoms sector, particularly in large ‘legacy’ service and network providers, like AT&T or Deutsche Telekom. However, they are less well represented in newer industry segments, and union density is particularly low in the programming and engineering jobs that are viewed as strategically important. Recent organizing campaigns have targeted these workers, with some success. In the US, the CWA’s Campaign to Organize Digital Employees (CODE-CWA) has increased union recognition and membership in digital media, game development, and software companies. Google Alphabet workers formed a union with the CWA in 2021; and in March 2022, retail workers at a contractor for Google Fiber, BDS Connected Solutions, won their union election. This win is particularly

significant, as over 50 percent of Google’s workforce is made up of this kind of temporary, vendor, and contract worker (TVC) – and solidarity between the permanent and ‘shadow workforce’ has been a focus of collective action and organizing at large tech companies (Glaser, 2018).

In Germany, the ICT industry also has relatively weak collective bargaining structures and low bargaining coverage; particularly compared to manufacturing sectors. There was no sectoral agreement established after liberalization of telecoms; and the presence of multiple unions – including the two large DGB unions ver.di and IG Metall – in different IT and telecom firms has made it difficult to coordinate organizing or bargaining strategies (Doellgast, 2009). However, bargaining coverage through company-level agreements is higher in comparison to the US, and larger firms often have works councils. For example, IBM has had a union agreement (now with ver.di) since the mid-1990s; and ver.di coordinates meetings and workshops that bring together IBM works councilors with works councils at other IT services firms. IG Metall has a number of agreements with ICT companies that started as subsidiaries of manufacturing firms or that acquired these subsidiaries, including Vodafone, Nokia, Siemens, and Infineon. And IG Metall has organized a number of projects to represent and organize white-collar workers (Haipeter, 2016), with a focus on both growing IT occupations within both traditional manufacturing firms and newer ICT and tech firms or subsidiaries.

These efforts to organize the growing ICT workforce face an uphill battle, with similar challenges in the US and Germany: including the difficulty establishing a culture of collective action among more highly educated white collar workers; and weaker structural and institutional power among the more precarious gig or contingent workforce. ICT unions are already active in a range of campaigns to extend existing laws to workers on freelance or temporary contracts and organize workers across different industry segments. These are an important starting point for a longer term goal of establish stronger sectoral bargaining for the growing ICT sector, so that workers can develop strong and coordinated collective institutions based on a solidaristic identity – to serve as an effective counterpart to increasingly interconnected employers.

Firm and workplace-level agreements. Finally, unions and works councils are negotiating agreements at the firm and workplace levels to influence technology adoption, as well as how employment is restructured as a result. In this area, existing industrial relations institutions and collective agreements are important resources, as unions adapt old tools to negotiating over new technologies. In the ICT sector, unions have long negotiated over monitoring intensity and methods, as technologies to, for example, record calls, track keystrokes, and monitor the location of field and network technicians have been widely used for decades. In the US, collective agreements in telecom firms often place limits on the number of calls that can be monitored or how supervisors observe and coach employees (O’Brady and Doellgast, 2021). These provisions then can make it more difficult to implement tools like speech analytics, as this requires all calls to be recorded and transcribed. The adoption of AI-based coaching or scheduling tools would also require conformity with collective agreements – triggering negotiations over how these will be used. In addition, job classifications that narrowly define job scope and tasks can require management to compromise with unions. As they put in place new employee assistant or end-to-end diagnostic systems that allow employees to handle a broader range of tasks or call types, this often requires renegotiating these classifications.

In Germany, works councils have much stronger consultation and bargaining rights compared to US unions. They have particularly strong co-determination rights where technology is used for *Leistungs-*

und Verhaltenskontrolle – or performance and behavior control. This has been an important tool, combined with strong data protection rules in Germany, for influencing decisions concerning how new ‘labour controlling’ digital technologies are adopted. Many works agreements (*Betriebsvereinbarungen*) ban outright the collection or recording of individual performance data, for example. In addition, the Works Constitution Act was amended in 2021 to explicitly give works councils the right to be informed about and consult over plans to adopt AI; and it extends co-determination rights over selection guidelines for hiring, transfers, and terminations to include situations where AI is used. Works councils are able to engage a company-funded expert to consult on proposed changes or policies, and this is now required where AI is involved.

These rights can be used to place limits on how specific labour controlling technologies are implemented in the workplace, but can also encourage broader partnership-based initiatives to increase worker voice in decisions around labour replacing or displacing technology investments. Deutsche Telekom is an interesting case study, as the works councils have negotiated a range of creative agreements on digitalization and AI. One important tool is a 2010 agreement, in which management agreed that potential job cuts due to automation would first be handled through reducing the volume of outsourced work. This has led to a drastic drop in contact center and back office outsourcing, and relative stability in the internal workforce in these areas.

The works councils also negotiated a series of works agreements that provide a framework of rules around how digital and AI-based technologies are adopted and used. First, an agreement on IT systems establishes a process where the works council is consulted before a new technology is purchased or developed in-house, in the early planning phase; and then both sides are able to decide whether there is a need for formal negotiations depending on the risk to employees. Second, an agreement on digitalization seeks to encourage more consultation and information exchange around planned digitalization initiatives. Management draws up a ‘digi-road map’ with all of the measures that they have planned across several years. Then they analyze this road map together with the works council using a ‘DigiBoard’ and discuss what the impacts will be on the firm, employment numbers, work content, and service quality. The works council takes this information and develops a strategy and plan, together with the working group ‘Innovation’ and the different regional and subsidiary works councils – which feeds into new works or union agreements.

A further set of initiatives by the works council focus specifically on AI-based technologies. At the time of writing, a pilot project on workforce analytics was in the process of being implemented and evaluated. The agreement included provisions restricting workforce analytics, and employee data collected and used for analytics, to purposes aimed at improving the working environment; and prohibited their use to monitor employee performance or behaviors. Databases must be designed so no conclusions can be drawn about individual employees. Transparency under data protection laws must be ensured, based on following certain procedures outlined in the agreement. And automated decisions (e.g. without human oversight) were prohibited. In addition, an expert group with worker and employer representatives was established, with a detailed procedure of review concerning the use of employee data and AI-enabled analytics tools. The works council also drew up a draft AI ethics manifesto, with specific principles concerning how AI would be used across Deutsche Telekom – and a recommendation for establishing an AI ethics expert circle [*Expertenkreis*] at company level to ensure adherence to these principles. This was still being discussed at the time of my interviews.

Similar initiatives had been launched at IBM Germany. The IBM works council negotiated an agreement in 2021 requiring management to categorize all AI systems in five categories and three groups, green, yellow, red – based on the level of risk for employees. AI was considered low risk if it was only used to make recommendations to employees: for example, on books to read or training employees might benefit from. Technologies automating management decisions, particularly in a way that could potentially harm employees, were considered high risk and not allowed. For middle categories, there was a more intensive process of works council oversight, to make sure employees understood the system and to ensure its fairness. An ‘AI ethics committee’ [*KI Ethik Rats*], including management and worker representatives, as well as AI experts from the company, was established to correct mistakes or make recommendations for changes.

These agreements show creative adaptation of traditional co-determination rights to a new set of challenges associated with digitalization and AI. They also establish a process that encourages more collective deliberation about how new technologies are adopted, requiring management to think through their planned investments, explain them to different stakeholders, and then implement them in a more transparent and fair way. In interviews, works councils stressed the ‘mutual gains’ from these agreements, protecting employees’ control over their work, job security, and overall well-being, while also supporting better decisions around skills and work organization. In the US, the process of new technology adoption appeared to be less efficient, as telecom companies struggled to figure out how to get employee and union buy-in to new tools like speech analytics with less direct engagement or negotiation on how they planned to use these tools.

Conclusions

While many argue that the potential employment impacts of new digital and AI-based technologies have been over-estimated, it is clear that they are having deeply transformative effects on jobs in the ICT sector. This sector is also an important bellwether for a broader process of restructuring in progress or on the horizon in other industries. ICT companies are responsible for researching and commercializing innovations in digitalization and AI, and also enthusiastic users of these innovations to restructure their own service jobs.

This paper has sought to map out both the challenges these rapid changes are posing for labour unions and other worker representatives, as well as how they are responding across three different action fields. First, unions are seeking to influence state policies that shape competitive conditions on the one hand (e.g. infrastructure investments) and digital privacy and ethics rules on the other (e.g. data protection and AI regulations). Both are crucial for establishing the landscape of resources and constraints firms face as they develop employment strategies associated with digitalization and AI. Second, unions are working to organize new groups of workers, extend inclusive labour market protections, and establish solidaristic bargaining structures. These strategies aim both at limiting employers’ capacity to use new technologies to move work to more precarious contracts and at building power across groups of employees who are linked in segmented value chains. And third, unions are negotiating at firm and workplace levels over the adoption and use of new technologies. These strategies involve creative repurposing of existing bargaining rights and structures, or in some cases new legal rights connected with AI regulation, to strengthen worker voice in and oversight over these decisions.

All three action fields can be seen across countries with different industrial relations and welfare state traditions. Differences in existing institutions clearly influence the focus and success of efforts in each area (Doellgast and Wagner, 2022; Lloyd and Payne, 2019). German unions and works councils have used their stronger co-determination and data protection rights to negotiate the most far-reaching firm- and workplace-level agreements in ICT firms – with a particular focus on data protection and ethical use of AI. At the same time, ICT unions across the US and Europe – together with other worker organizations – are also developing creative new approaches to encourage more social investment strategies, strengthen regulation, and extend social protections to new worker groups. Together, these can be seen as complementary components in a comprehensive program for adapting social regulation to digitally-transformed, cloud-enabled workplaces. Unions are the primary actors working across these action fields to strengthen democratic worker voice in decisions around the form labor rights should take, at a time when companies are experimenting with new applications of big data analytics and AI. Findings suggest that a central component of strategies should be international partnership and exchange, to establish best practices in the transition to a worker-centered digital economy.

This article gives an initial overview of findings and reflections from research that is currently in-progress. The innovations I am studying are also very much in-progress. There is a lot of uncertainty about how firms will compete or specialize, as they invest in a rapidly changing set of digital, cloud, and AI-enabled technologies. This uncertainty means that comparative employment relations research can potentially play an important role in providing empirically rigorous and theoretically grounded research findings to actors currently shaping these digital transformations. I argue in my book, *Exit, Voice, and Solidarity*, that labor power to contest expanded precarity is grounded in constraints on employer exit from encompassing institutions, support for collective worker voice in management decisions, and strategies of inclusive labour solidarity to organize and represent workers across the labor market (Doellgast, 2022). As technological change further expands employers' exit options, worker voice and labour solidarity are critical tools for reestablishing a balance of power within firms and in society, to ensure the gains from innovations are shared equitably and sustainably.

References

- Ajunwa, I, Crawford, K, & Schultz, J (2017) Limitless worker surveillance. *Calif. L. Rev.* 105: 735.
- Bank M, Duffy F, Leyendecker V, et al. (2021) *The Lobby Network: Big Tech's Web of Influence in the EU*. Brussels: Corporate Europe Observatory and LobbyControl e.V.
- Bernhardt, A, Kresge, L & Suleiman, R (2021) *Data and Algorithms at Work: The Case for Worker Technology Rights*. Berkeley, CA: UC Berkeley Labor Center.
- Boes, A & Langes, B (2019) *Die Cloud und der digitale Umbruch in Wirtschaft und Arbeit: Strategien, Best Practices und Gestaltungsimpulse*. Freiburg: Haufe-Lexware.
- Bormann, S & Haggenmiller, F (2019) *Die Zukunft des Kundenservice: Arbeit – Digitalisierung – Gewerkschaftliche Handlungsfelder. Ein Fallstudie am Beispiel der Deutschen Telekom Service*. Berlin: ver.di.
- Cogito (2022) *Cogito home page*. Available at: <https://cogitocorp.com/>.

- De Stefano, V & Taes, S (2021) *Algorithmic management and collective bargaining*. ETUI Foresight Brief #10, May 2021. Brussels: ETUI.
- Doellgast, V (2009) Still a Coordinated Model? Market Liberalization and the Transformation of Employment Relations in the German Telecommunications Industry. *Industrial and Labor Relations Review* 63(1).
- Doellgast, V (2022) *Exit, Voice, and Solidarity: Contesting Precarity in the US and European Telecommunications Industries*. New York City: Oxford University Press.
- Doellgast, V & Wagner, I (2022) Collective regulation and the future of work in the digital economy: Insights from comparative employment relations. *Journal of Industrial Relations*. Early View.
- Donegan, M (2021) DTWS: Vodafone shares how TOBi is growing up. *TM Forum*.
<https://inform.tmforum.org/ai-data-and-insights/2021/10/dtws-vodafone-shares-how-tobi-is-growing-up/>
- ETUC (2021) Commission's proposal for a regulation on Artificial Intelligence fails to address the workplace dimension. <https://etuclex.etuc.org/european-commission-proposal-regulation-artificial-intelligence>
- Glaser, A (2018) Google's "Shadow Workforce" Has Demands. *Slate*, December 5, 2018.
- Grimshaw, D & Miozzo, M (2006) Institutional Effects on the IT Outsourcing Market: Analysing Clients, Suppliers and Staff Transfer in Germany and the UK. *Organization Studies* 27(9): 1229-1259.
- Haenlein, M & Kaplan, A (2019) A brief history of artificial intelligence: On the past, present, and future of artificial intelligence. *California Management Review* 61(4): 5-14.
- Haipeter, T (2016) The interests of white-collar workers and their representation in the German manufacturing sector: new initiatives, opportunity structures, framing and resources. *Industrial Relations Journal* 47(4): 304-321.
- Holtgrewe, U (2014) New new technologies: the future and the present of work in information and communication technology. *New Technology Work and Employment* 29(1): 9-24.
- Holtgrewe, U & Schörpf, P (2017) Understanding the impact of outsourcing in the ICT sector to strengthen the capacity of workers' organisations to address labour market changes and to improve social dialogue (IMPOS). Final Report. Vienna: FORBA.
https://www.forba.at/forba_projekt/understanding-the-impact-of-outsourcing-in-the-ict-sector-to-strengthen-the-capacity-of-workers-organisations-to-address-labour-market-changes-to-improve-social-dialogue/
- Johnston, H & Silberman, M (2020) Using GDPR to Improve Legal Clarity and Working Conditions on Digital Labour Platforms. *ETUI Research Paper-Working Paper*.
- Kawalec, S & Menz, W (2013) Die Verflüssigung von Arbeit: Crowdsourcing als unternehmerische Reorganisationsstrategie-das Beispiel IBM. *AIS-Studien* 6(2): 5-23.
- Klosowski, T (2021) The State of Consumer Data Privacy Laws in the US (And Why It Matters). *New York Times Wirecutter*, September 6, 2021.
- Kormann, R (2021) Germany adds to recognition of platform workers. *Social Europe*.
<https://socialeurope.eu/germany-adds-to-recognition-of-platform-workers>.
- Lacity, M & Willcocks, LP (2018) *Robotic process and cognitive automation: The next phase*. SB Publishing.
- Lloyd, C & Payne, J (2019) Rethinking country effects: Robotics, AI and work futures in Norway and the UK. *New Technology, Work and Employment* 34(3): 208-225.
- O'Brady, S & Doellgast, V (2021) Collective Voice and Worker Well-being: Union Influence on Performance Monitoring and Emotional Exhaustion in Call Centers. *Industrial Relations: A Journal of Economy and Society* 60(3): 307-337.

- OECD (2022) *Information and communication technology (ICT)*. https://www.oecd-ilibrary.org/science-and-technology/information-and-communication-technology-ict/indicator-group/english_04df17c2-en
- Perez, C (2003) *Technological revolutions and financial capital*. Edward Elgar Publishing.
- Pfeffer, J (2018) *Dying for a paycheck: How modern management harms employee health and company performance —and what we can do about it*. HarperBusiness.
- Rothstein, SA (2021) Toward a discursive approach to growth models: Social blocs in the politics of digital transformation. *Review of International Political Economy*. 1-24.
- Wadlow, T (2017) Digitalisation in Customer Experience: Offering the Digital Choice. Reportno. Report Number |, Date. Place Published |: Institution |.
- Walker, P (2021) Call centre staff to be monitored via webcam for home-working 'infractions'. *The Guardian*, March 26, 2021.
- Willcocks, L & Hindle, J (2022) Becoming Strategic with Intelligent Automation in Telecommunications. *Robotic and Cognitive Automation*. <https://roboticandcognitiveautomation.co.uk/Blog47.html>
- Wong, JC (2021) Revealed: Google illegally underpaid thousands of workers across dozens of countries. *The Guardian*, September 10, 2021.
- Wood, AJ (2021) Algorithmic management consequences for work organisation and working conditions. *JRC Working Papers Series on Labour, Education and Technology*, No. 2021/07.