Negotiating limits to algorithmic management in digitalised services: Cases from Germany and Norway

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Abstract

Artificial intelligence (AI)-based algorithms are increasingly used to monitor employees and to automate management decisions. In this paper, we ask how worker representatives adapt traditional collective voice institutions to regulate the adoption and use of these tools in the workplace. Our findings are based on a comparative study of union and works council responses to algorithmic management in contact centres from two similar telecommunications companies in Germany and Norway. In both case studies, worker representatives mobilized collective voice institutions to protect worker privacy and discretion associated with remote monitoring and workforce management technologies. However, they relied on different sources of institutional power, connected to co-determination rights, enforcement of data protection laws, and labor cooperation structures.

Introduction

Artificial intelligence (AI)-based algorithms are increasingly used to automate management decisions, from hiring to training, performance evaluation and accompanying pay increases and discipline (Wood, 2021). This has raised new challenges for worker representatives in regulating how these tools are adopted and used in the workplace (De Stefano and Taes, 2021). While much has been written about the potential dangers of these tools to workers (Griesbach et al., 2019; Kellogg, 2020; Wood, 2021; Wood et al., 2019), there has been less analysis of the conditions under which workers can influence their use within workplaces.

In this article, we ask how worker representatives adapt traditional collective voice institutions to regulating new algorithmic management tools, based on a comparison of contact centres from two similar telecommunications companies in Germany and Norway. In both case studies, unions and works councils succeeded in protecting worker privacy and discretion associated with the use of remote monitoring and workforce management technologies. However, they used different institutional resources. Firm-level co-determination rights and structures supporting cooperation among worker representatives were central in the German case study; while unions in the Norwegian case relied on legal action through the National Data Protection Agency to re-establish their role in bargaining over new technologies.

Our analysis is original in several ways. First, we examine negotiations over algorithmic management in standard work settings with well-established unions. Most research on AI-based management tools has focused on non-standard work, especially gig work (Wood, 2021). Such workplaces are typically non-union. Some studies have documented the evolving role of works councils in Germany (Schreyer, 2021) or collective bargaining in Nordic countries (Ilsøe and Söderqvist, 2021) in supporting workers' voice in the use of algorithms in app-based workplaces. However, these agreements are relatively new, union membership is typically low, and gig workers face broader barriers to exercising voice. In contrast, we compare standard workers in coordinated European countries who enjoy strong traditions of and supports for worker involvement in new technology adoption. We are thus able to provide new empirical insights into 'what is possible' for worker representatives in settings where we would most expect both stronger countervailing labour power and partnership over new strategies that protect worker well-being.

Second, our findings contribute to debates on the role of institutions in the deployment and worker impacts of novel AI-based technologies. These impacts have been found to differ across national and industry settings, due to the 'embeddedness' of these decisions in distinctive training (Krzywdzinski, 2017) and social dialogue institutions (Bosch and Schmitz-Kießler, 2020; Lloyd and Payne, 2019). However, recent research reports more mixed findings, with many studies finding steep barriers to negotiating workplace- and firm-level agreements on new digital and AI-based technologies – including insufficient understanding of the technologies, low union density among white collar workers, centralization of decision-making, or a preoccupation with job loss due to automation (Doellgast and Wagner, 2022; Haipeter, 2020; Lloyd and Payne, 2021; Stroud et al., 2020). Our findings demonstrate that collective bargaining can play a central role in developing more ethical approaches to combining 'human and machine' in digitally enabled management practices. However, it does require overcoming some of the barriers identified in these past studies, with formal institutional power playing a crucial role in strengthening collective worker voice in these negotiations.

The paper is structured as follows. First, we discuss past research on algorithmic management, focusing on the tools used in service and contact centre workplaces. Second, we describe our research design and give background on institutions in Norway and German institutions relevant to our analysis. Third, we compare the findings from our two case study firms. Finally, we outline our findings' contributions to academic, policy, and union debates.

Algorithmic management and its effects on service workers

Defining algorithmic management can be complicated because it includes many technologies and tools. *Algorithms* are automated instructions for performing tasks, spanning from simple 'if … then' statements to complex mathematical equations. They are the building blocks of AI and facilitate machine learning. Algorithms can be modified based on learned inputs and data or allow digital systems to learn 'through experience' and autonomously improve task performance over time (Charlwood and

Guenole, 2022). Coined by Lee et al. (2015), *algorithmic management* refers to supplanting management functions with machines that exercise at least some level of decision-making authority over workers. Algorithms are used most often to automate direction, evaluation, and discipline or rewards (Kellogg, 2020).

In this paper, we focus on two categories of management technologies that are commonly used in contact centres. The first is monitoring technologies that can be used to record and evaluate workers' calls, screens, and keystrokes. Speech analytics software is an increasingly common technology that relies on natural language processing and machine learning to extract, transcribe and analyse voice conversations (Qualtrics, 2022). It is often used to measure both customer and employee sentiment and can facilitate real-time analysis of calls or interactions. Speech analytics is often paired with other tools to monitor and direct workers; for example, AI-based coaching apps use speech data to provide instant advice on customer management.

The second technology is workforce management software, which relies on workforce analytics. Workflow algorithms can be used to match workloads with employee schedules (Angrave et al., 2016). Analytics tools can also allow management to evaluate programmes and inform decisions related to training, employee advancement, and equity and diversity goals. These tools increasingly incorporate advanced machine learning (Chamorro-Premuzic et al., 2021; Otto, 2018), providing more options for automating hiring, scheduling, performance appraisal, or training decisions. Common software packages, such as Microsoft 365 and Microsoft Teams, also increasingly use algorithms to track employee behaviours and productivity (Galliers et al., 2017; Ajunwa et al., 2017).

An important question is who benefits and who bears the costs from the widespread adoption of these new algorithm-based management tools. Optimistic accounts suggest that electronic monitoring and speech analytics can improve service quality through providing more targeted and appropriate coaching. Workforce analytics can generate efficiencies by aligning employees, tasks and schedules; improve fairness by removing managerial bias; and help organisations enforce data security or detect fraud (Otto, 2018).

However, these technologies also can harm worker well-being and exacerbate inequality. Call monitoring has been linked to high worker stress, especially when metrics and procedures are perceived as unfair (O'Brady and Doellgast, 2021). Speech analytics is typically accompanied by more intensive monitoring, scaling up organisations' capacity to examine the content of all calls and employees' tone of voice and use of pauses. Workforce management can reduce working time control through enforced schedules with little consideration of individual needs, and it can restrict employees' ability to contest unfair metrics or evaluations. Extensive use of workforce analytics has been found to contribute to work intensification and stress, particularly when decisions are perceived as opaque and unpredictable (Kellogg, 2020; Krzywdzinski and Gerber, 2021; Moore, 2017). These technologies often reinforce forms of gender and racial inequality, as algorithms rely on historical data, make statistical inferences, and lack data on vulnerable populations (Todolí-Signes, 2019; Kleinberg at al., 2018). Moreover, their use in management decisions is often not transparent to employees or even fully understood by managers. This can create barriers to workers' influence on these decisions and their ability to seek recourse.

We are interested in how worker voice can affect the ways in which AI-based technologies are mobilised, allowing businesses to benefit from their strengths while mitigating potential harms to employees. Can supportive institutions affect worker representatives' ability to negotiate agreements or establish processes that improve democracy and transparency in the use of algorithmic management?

<div align="center">Regulating algorithmic management: A case comparison</div>

Methods and case selection

We compare worker representatives' strategies to regulate the adoption and use of algorithmic management in telecom contact centres in Germany and Norway. We interviewed 18 union and works council representatives from two similar case study firms—8 in Norway and 10 in Germany. Interviews were recorded, transcribed and coded using NVivo. The interviews were conducted as part of an ongoing study on worker responses to AI and digitalisation in the information and communication technology (ICT) industries; thus, we could contextualise our case study findings in broader sectoral and company-level developments. In both cases, we also analysed collective agreements and other documents, and in Germany we included consultant reports summarising interviews and survey findings relating to technology adoption.

Our research design is based on a matched case method, where we examine two large, unionised telecom firms in different national institutional settings. Norway and Germany have both traditionally been described as coordinated or social market economies, with strong unions and high levels of social protection. Union agreements regulate a range of topics relating to pay and working conditions, with local social dialogue occurring via works councils (Germany) or union shop stewards (Norway), giving workers some democratic say in management decisions concerning use of monitoring or scheduling technologies.

Both countries also share an overarching regulatory framework from the EU/EEA. An important common tool is the EU General Data Protection Regulation (GDPR) of 2018, which codifies individual rights and controls over the use of personal data. While only one article in the regulation directly addresses data protection rights in employment (Ponce, 2021), the broader rights provide workers with new avenues to challenge algorithmic decisions, including rights to transparent and fair ratings (Silberman and Johnston, 2020; Todolí-Signes, 2019). Furthermore, the GDPR recognises collective agreements as important for 'processing data rights and governing algorithmic decision-making' (De Stefano and Taes, 2021: 9).

National and sectoral industrial relations institutions also differ in meaningful ways. In Norway, a sectoral collective agreement (*tariffavtale*) for the ICT industry is negotiated by the main union confederation (LO or YS) and the employers association (*Næringslivets hovedorganisasjon*). Workplace-level representation is 'single channel' – and while local union representatives must be consulted on new technologies, they have no direct negotiation or veto rights. At the same time, rights for unions and workers to participate in decisions connected to new technology adoption have been incorporated into the general agreement at national level between the LO and NHO, as well as in the Work Environment Act (Lloyd and Payne 2022). A dispute at the workplace or company level that cannot be resolved

between the union representative and employer is forwarded to the central union, then to the union umbrella organisation and its counterpart on the employer side. In addition, a company typically includes multiple unions representing different occupational groups.

In Germany, there is (effectively) no ICT sectoral collective agreement. However, most major telecom firms are covered by company-level agreements (*Haustarifverträge*) negotiated by either ver.di or IG Metall. Unions are organised at the industry level; typically, one large union from the main union confederation, DGB, negotiates agreements and advises works councils in a company. There is a separate 'dual channel' system of works councils at the company and workplace levels that are independent from but often closely coordinated with the unions. These works councils have stronger formal bargaining rights compared with local union representatives in Norway, including co-determination rights where technology is used for *Leistungs- und Verhaltenskontrolle* – or performance and behaviour control. Many works agreements (*Betriebsvereinbarungen*) ban the collection of individual performance data, representing a potentially hard limit on the use of speech analytics tools or workforce management software. If management wants to introduce these tools, it will need to allay fears concerning data use and implications for employee well-being or economic outcomes.

Germany's Works Constitution Act was amended in 2021 to clarify that works councils' consultation rights on new technologies extended to plans to adopt AI. It also extended co-determination rights over selection guidelines for hiring, transfers and terminations to include situations where AI is used, and it requires companies to fund an expert (engaged by the works council) to consult on proposed changes or policies involving AI.

In the next section, we examine how worker representatives use different tools to negotiate over or to influence the adoption of algorithmic management in contact centres.

Case study findings

In both case study firms, AI-based software tools have broadly transformed the volume and content of contact centre work. First, chatbots and voicebots are used to interact with customers using natural language; they can be 'trained' to understand and respond to selected topics and carry out simple tasks once handled by employees in contact centres, such as bill payment or changes to customer plans. Chatbots increasingly apply inference-based processes to recognise connections in data, learning from experience to continuously improve the answer quality. Consequently, contact centre employees often receive more complex calls that take longer to resolve.

Second, back-office robotic process automation (RPA) (applying similar algorithm-based technologies) has been used to replace business process tasks like entering orders, creating invoices and processing cancellations. In both case studies, this work was traditionally carried out in offshore locations, some of which were downsized or closed. However, these tools also affected the frontline workforce by 'peeling off' simpler data entry from frontline contact centre jobs. Thus, employees spend more time directly interacting with customers.

Third, front-office assistance systems support customer advisers by giving them algorithm-based suggestions to address customer requests. Because agents do not have to search multiple databases, they can respond more quickly. In addition, automated diagnosis systems support employees in handling customer calls related to disruptions, using algorithms to lead them through each question and guide them to resolve the problem. Thus, 'the system "learns" (in quotation marks) and becomes faster' (Works councillor, Germany, Dec. 2021), leading tickets to be processed more efficiently and with fewer errors.

These AI applications have together changed the content of contact centre work. Interviewees in both cases noted that the intensity of their work had increased:

> One has cut out a lot of time in the client dialogue with the automation of systems that retrieve info on clients and one has all kinds of systems that come up with proposals on what the client might be interested in and what one should mention to the client, increasing stress and complexity. (Union B rep, Norway, Jun. 2021)

> In addition to the issue of job losses, there is also an issue that, especially when using digitization or artificial intelligence, where there are many simple or perhaps recurring activities, then a machine takes over. As a result, as a call centre agent, I increasingly can only get complex or difficult cases. So my work and I are also changing. And there can be pressure to perform, because of course you can't do as much in terms of quantity because the complexity is there. (Works councillor, Germany, Sept. 2021)

Front-office assistant systems can have contradictory effects on employee skills and discretion. They allow employees to handle more diverse calls, increasing complexity and variety – especially when combined with the decline of simpler, more transactional requests. Employees can focus on interacting with customers rather than looking up information. However, they experience less discretion, with the software providing a constrained set of options or reducing employees' ability to draw on their own technical knowledge.

The above changes primarily concerned applications of AI to automate or rationalize aspects of contact centre work, and thus raised concerns for worker representatives about the potential impact of AI on job content and quality. These were an important part of the context of technological change in our case studies, as union and works council representatives sought to negotiate over both the broader impact of AI and the specific algorithmic management tools discussed in more detail below.

The German case

In the German telecom case, the works council organised a project in the mid-2010s to analyse how digitalisation was affecting employees. A series of agreements provided a framework of rules around using digital and AI-based technologies and a process for identifying when co-determination was needed.

In the works agreement on IT systems, a process was established whereby management would consult with the works council before purchasing new technology. Based on an evaluation of the risk to employees, they would decide whether formal negotiations were needed. One works councillor explained that this was negotiated in response to a problem on both the management and employee sides: the company was purchasing new software 'as a service' with a long lock-in period but only discussed possible effects on the workforce after the decision had been made. Management lost money when they were unable to customise expensive software to comply with data protection rules or works council demands. And works councillors believed that they would have more influence if they were consulted earlier in the process (Works councillor, Sept. 2021).

An important criterion for evaluating 'risk' was whether the software could record or track data on individual employees, with all results needing be aggregated to groups of five employees or more.

In a second agreement, management committed to drawing a roadmap with digitalisation measures planned for the next several years. The works council and management then discussed the potential impacts on employment numbers, service quality and work content, feeding into strategic planning regarding the need for new agreements to regulate specific measures or technologies. The agreements provided a framework for broader consultation and evaluation of technologies that could be outside the typical purview of formal co-determination rights but that could have significant impacts on job numbers and the quality of work.

The works council also negotiated framework agreements across the corporate group that focused on AI-based technologies. One is a pilot agreement on workforce analytics, which states that they should be used to improve the working environment and support management decisions. This agreement prohibits using workforce analytics to monitor individual employee performance or behaviour or making automated decisions without human oversight. Databases must be designed so that all data is anonymous, and no conclusions can be drawn about individual employees. Transparency under data protection laws must be ensured, particularly regarding mathematical-statistical (or algorithmic) processes. Special measures are required for certain categories of personal data, with reference to the GDPR. The agreement establishes a 'Workforce Analytics Expert Group' with equal works council and employer representation; it reviews the use of employee data and AI-enabled analytics tools, holding regular workshops to evaluate the use of workforce analytics and including provisions for training employees (with works council involvement) to use workforce analytics responsibly.

A works councillor (Sept. 2021) explained that the employer increasingly wanted to use employee data for different purposes, some of which could benefit the workforce: 'Today, thanks to […] artificial intelligence, we have […] a great deal of data—big data. The employer would also like to use employee data'. Examples included evaluating training needs or analysing the success of training programmes in helping workers advance in their careers or understanding patterns of gender discrimination and the success of programmes targeted at supporting higher rates of promotion for women. The works council was concerned that this might be abused without protection:

> 'Any analysis you [the employer] want to make must first be presented [to the works council]. What do you want to do? Which questions do you want to answer? Then we check what happens

to the data, to ensure that no single person can be identified as a result. So we are involved in the data protection of the group. And then we are part of an expert group, 'Workshop Analytics', that is made up of employer and works council representatives. This expert group checks if the analysis question is okay. The method is okay. And then releases the findings. One thing that can happen is: the result is there, so after the black box you get a different result. But some of what you find out, you did not know you were looking for beforehand. That means: I'm looking for A. But I can still see B and C. That can be dangerous. So the expert group also checks the result. [….] This is an […] example of how, with modern technology and the participation of interest groups, the works council can also develop a new method or agreement in the company to protect employees. (Works councillor, Sept. 2021)

The works council also drafted an AI ethics manifesto stipulating how AI would be used and recommending that an ethics advisory board be established to ensure adherence to the manifesto's principles. The manifesto's purpose was to promote trust in AI systems by increasing transparency. First, it included a requirement that interactions between employees and 'learning machines' be designed so that employees would know they were interacting with a machine. Second, it stated that the company's works agreements apply to AI concerning protections against machine-based performance control and unauthorised use of employee data. For example, in the IT agreement mentioned above, there is a requirement that when IT systems produce reports, individual results are aggregated to a group of no fewer than five employees. Third, human decision makers must make personnel-related decisions that have legal effects on employees or significantly influence them: 'This means that, for example, when it comes to recruiting, AI could not decide […] whether we will hire [the candidate]. […] A human being has to make such an important decision on personnel' (works councillor, Oct. 2021).

Employees indirectly affected by AI could request that the responsible person check the systems used: 'When employees say: you've now used AI to produce a result that may concern me—they have the right to have this decision checked by a human being' (works councillor, Oct. 2021). Finally, certain uses of AI are prohibited, including gathering personal information about employees, such as their political opinions, philosophical beliefs, union membership, or sexual orientation; or seeking to analyse or influence employees' emotions or mental state. Thus, the employer cannot require employees to use technologies that ascribe personality traits or use biosensors:

There are now already the first AI applications that say that, with the information from my body, my blood pressure, everything you can see is information that you can perhaps control by not giving the customer, who may also be emotionally excited, to this employee there. And you can imagine what can happen to people with that information—that is the great danger that we see. (Works councillor, Oct. 2021)

Collective agreements have historically limited the use of remote monitoring technologies, prohibiting use of speech analytics to monitor employee emotions or direct implementation of AI-enabled coaching apps. An important provision is that individual performance data can only be gathered for groups of employees: 'We always include this kind of data protection clause. […] If at least five people were involved in an evaluation or a report, then that's a good level for us to say that it's not so simply personal/individual' (works councillor, Dec. 2021).

Another restriction relates to who can access data, with a division between trainers and team leaders. Employees can access personal performance data but choose whether to share this with team leaders, who are prohibited from requesting this data.

At the same time, all calls are now recorded (where the customer has given permission), allowing the company to 'mine' customer calls to respond quickly to problems and train chatbots or other self-service tools. The works council assumed that employees were protected from invasive, individual-level monitoring. However, not all managers followed the rules of the agreement:

> 'The problem is that when we regulate something, these rules must also be observed by the managers. This means that not everything that is technically possible is allowed. Because if we make concessions and say: "yes, you can use this information to train employees; and you shouldn't put pressure on the employee here, but rather focus on quality." According to the motto: "I see your conversations are always long, let's do some coaching, let's talk, what can you do differently?" But I can also use it differently every time and write an e-mail to my employee with letters like this in red and five exclamation marks: "Your numbers suck, make sure they're better tomorrow." So, the tools are there, but how do I use them as a manager? And that's not easy to enforce, but the greed for just-in-time reporting or just-in-time data and that - if it is possible […] is there because you always hope that the sooner you know how the numbers are changing, the sooner you can react. (Works councillor, Dec. 2021)

Thus, the works council had an important ongoing role in monitoring how managers used employee data, as well as educating the workforce on the rules so that they would report any abuses.

Further workforce management tools have been regulated under the above framework agreements. For example, managers cannot access employees' Outlook calendars, only information that is important for projects. WebEx videoconference tools cannot measure working time. Employees are not required to turn on their cameras for meetings, and there can be no recording of team meetings and training. Agreements regulate when team leaders listen to employee calls and for how long.

The framework protects employees from invasive monitoring or privacy abuses from algorithmic management. The works council established a process for co-determination and oversight over the future adoption of workforce analytics and other tools based on clear principles and an expert-based review process. This process also reduced the risk of works council opposition to expensive IT systems, standardising the co-determination process and improving workforce trust with how managers were using potentially controversial tools—particularly employee call recording. The company had taken a leadership role in digital ethics, creating a small department to work on these issues and a set of AI principles for its internal procedures and suppliers:

> If new IT applications are to be used, they must have prior approval from data protection for IT security. […] There is now also the area of digital ethics, so that those who have to buy or build AI confirm that they have complied with the relevant ethical criteria. There are now not only guidelines for communicating externally but also for implementing and operationalizing them internally. (Works councillor, Dec. 2021)

In the ICT sector, companies are developing and selling proprietary AI-based IT systems and partnering with other firms to combine AI with traditional technologies and mine customer data to identify new opportunities. Thus, AI ethics has a broader meaning, and telecom firms are under public scrutiny concerning how they use these technologies.

The Norway telecom case

In the Norwegian telecom case, technology adoption was shaped by a formalised agreement that provides unions with firm-level information and consultation rights for negotiating how new technologies affect job quality. Trade union representatives observed that this provision gives them tools to influence how new technologies affect workers. While this formal provision is of critical importance to unions, representatives also assert that enforcement is only possible under conditions of mutual trust and with management's recognition that trade union involvement is integral to organisational change (union A rep, May 2022). This becomes evident in the specific case of AI enabled workplace monitoring when the informal and trust-based dialogue between unions and management shifted to a confrontational negotiation about the extent and nature of workplace monitoring. This was an incremental process and involved several shifts or changes in technological applications.

Around 2010, a major shift in work organisation occurred within contact centres. This was linked to management initiatives to improve the customer experience. Previously, managers invested considerable resources to measure the quality-of-service interactions through telephone-based customer surveys. Due to limitations in resources and accessibility, these surveys only captured a small subset of customers. However, the 'shift to [AI powered] SMS' scaled up this potential by enabling 'every customer to give feedback' (Union A rep, May 2022)

In addition to providing tools to improve service quality, AI-enabled software also entrenched new forms of surveillance.. One trade union representative described this as a shift in focus from collective results to employees' individual achievements:

> You get tight follow-up from the team managers to every individual. […] We saw that it started to be linked to bonuses and pay. Then, of course, our members were provoked, and there was a lot of dissatisfaction in the call centre. […] Our local shop steward […] made an agreement with the management that they were not to monitor individuals. (May 2022)

An agreement was struck where only results aggregated across at least five employees could be evaluated. However, management soon reintroduced the bonus system on a voluntary basis. When employees objected, the union and management initiated a formal dialogue on union rights over individual performance monitoring. Management's main motivation to agree to these proposals was the union's strike threats (union A rep, May 2022).

At the firm level, labor-management relations became more conflictual with the introduction of the Customer Operations Performance Centre certification[1] around 2012. This facilitated the introduction of

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[1] An industry standard for how to run call centres.

the Transaction Monitoring Record (TRM) control and surveillance system, which enabled managers to produce audio and screen recordings of the work of 400 customer service employees, raising concerns about both job quality and workers' privacy rights. The TRM system was 'a very different way of viewing the development of employees than what we're used to [...] in Norway in general. Sick leave will [...] rise when people are not satisfied at work; I believe we were sometimes over 20%, and that's very high' (union A rep, May 2022).

In the TRM system, everything that happened on employees' computer screens could be recorded: 'Not only voice recording but recording of the screens...and you don't know what a team member will write to you on an IM-message during the recording' (union A rep, May 2022). Moreover, employees were not notified when they were recorded. This practice led to a major conflict between the trade union and management, starting with deliberations at the company level. Managers justified this practice by arguing, 'if we notified employees we were recording, then they would do the work correctly' (union B rep, May 2022) only because they were being watched. The unions argued that screen recording is equivalent to closed-circuit television recordings. Video monitoring can also capture private matters over which the employee has no control; for example, private e-mails or messages could pop up on the screen.

The use of video monitoring led to long discussions that could not be resolved at the firm level. The discussion moved to subsequent levels of consideration without finding a resolution. In 2018, union A and its confederation asked the Norwegian Data Protection Agency (*Datatilsynet*) for an assessment. The union undertook a public relations campaign to generate awareness of the controversial practices and put pressure on employers. The Norwegian Data Protection Agency found that the monitoring violated the regulation that restricts employers from viewing employees' private e-mails. The union won not because employers did not notify employees when recording would occur but because the system violated employees' privacy rights (union A rep, May 2022). Thus, video monitoring was scrapped, but voice monitoring was still common practice:

> Management can see how many meetings you have and how long they are. How long you are working on follow-ups of the cases you work on, how many breaks you take and so on... It is the largest monitoring system we have that management has full access to. (Union B rep, Sept. 2021)

Cooperation and new restrictions on video monitoring, supported by the National Data Protection Agency's rule, were important to re-establishing trust. Moreover, a change in management occurred after this conflict. According to union representatives, the new management team recognized the importance of unions to organisational change. They were thus more optimistic that future discussions around AI-related workplace changes could be resolved through firm-level union and management discussions. Hence, the combination of formal rights and management attitudes were both viewed as important for outcomes.

At the time of our interviews, the unions were consulting on several new tools for algorithmic management. For example, management wanted to introduce a training platform called 'HowNow', which uses real-time analytics to benchmark a team's capabilities and identify skill gaps (HowNow,

2022). They were discussing how this would be introduced with the 'learning and development people', who were not as accustomed to social dialogue (union A rep, May 2022). The union could also draw on past experiences with regulating tools like Microsoft Office 365, where they had restricted management's use of data and engaged in dialogue between the unions and management prior to deploying markers in the software. Management 'didn't understand why we were so obsessed with that [Microsoft markers]', but they agreed to the guidelines (union A rep, May 2022).

Union representatives were also participating in a taskforce to consult on an AI-based speech analytics tool that would record all customer calls. A vendor had been selected, with plans to implement the tool later in the year. The stated purpose was to improve customer service by reacting more quickly to widespread issues, such as a specific fault or technical problem. The union's aim was to restrict the use of recorded data so that it could not be used to evaluate employee performance:

> The union was involved in this from quite early on. We are now in the late phases of the project and involved in giving feedback to [the employer]. It's crucial that this system is only used for what it's intended for. All data are anonymised […] you can't see the customer or the customer service representative. […] You can't see who is taking the call or calling. (Union B rep, May 2022)

Union representatives were confident that they could regulate the tool, ensuring that predictive algorithms were only applied to analyse the customer side of calls. One union B representative discussed how 'call to text' transcripts are 'important for us to make sure that the data are only used for that' (May 2022). This helped ensure that speech analytics would not be used to tighten control over performance by introducing AI-based coaching tools:

> Nothing has changed from the old one-on-one monitoring. Now text to speech is on every call, but we were promised that it won't identify individuals. Of course, we know that it will always be possible to do this if the data are there. But to […] use speech analytics at an individual level […] that would need to be followed by informing and consulting with us or having negotiations up front. (Union B rep, May 2022)

Monitoring is possible in principle, but the union agreement restricts its use. The Norwegian Data Protection Agency's ruling has constrained any further management action to introduce different or more encompassing monitoring measures – thus, from the perspective of the union, 'the case from 2018 is vital' (union B rep, May 2022).

These examples show that Norway's consultation rights and an informal trust-based system can be resources for employee voice in whether and how new monitoring and workforce management tools are used in the workplace. However, even though trade union representatives are optimistic about the possibility of positively influencing management decisions, they are also realistic that their concerns 'can also [be] ignored to implement more control measures. We have our concerns, and they may listen, but they will do the changes that they would like' (union B rep, May 2022).

Comparison

The cases show similar dynamics, with union representatives or works councillors seeking to use collective voice—via consultation or negotiations—to protect employee interests associated with new technology adoption. In both cases, worker representatives sought to restrict monitoring and establish rules on how employers collected and used employee data. In many ways, new algorithmic management software represents an intensification of past monitoring technologies established in contact centre workplaces rather than something radically new. Worker representatives could also draw on well-established processes and rights to exercise collective voice. They succeeded in restricting how managers use employee data and protecting employees from the invasive use of speech analytics to automate coaching and performance monitoring.

The main substantive differences between the cases concerned how worker representatives responded to the challenges or situated algorithmic management tools within them. In the German case, works councils organised a proactive set of projects focused on establishing regular co-determination and consultation over future digitalisation measures; and they negotiated a formal set of works agreements that included a structure of rules and committees for evaluating the use of different tools. Their workforce analytics pilot agreement and AI ethics manifesto lay out principles concerning how employee data could and could not be used and mechanisms for employees to contest or access information on algorithm-based decisions.

In the Norwegian case, collective bargaining rights and structures also helped influence new technology adoption. However, unions relied on established traditions of negotiating rather than developing new projects like those at the German case, targeted at establishing formalized agreements in relation to AI enabled workplace changes. The National Data Authority Agency proved important as a source of 'institutional power' when traditional union-management negotiations could not arrive at a solution. The level of remote monitoring introduced in the Norwegian company, including continuous video recording of calls, was never allowed in the German case. But the union eventually used the legal framework of data protection rules to strengthen controls on how employee data were recorded and used. Combined with a change in management, this re-established the tradition of more consensual social dialogue. When we asked union representatives if they planned to codify the outcomes for new technology in formal agreements, they observed that they avoided writing things down formally because they were afraid that management could use it against them later. They appeared to prefer more informal consultation (if management cooperated). This contrasts with the German case, where the signing of formal works agreements was clearly prioritised and a central means of regulating and enforcing standards.

Both models effectively moderated the adoption and use of AI, but with different potential strengths and weaknesses. The Norwegian case appeared to be more vulnerable to management exit in the short-term. But union successes could potentially be more easily replicated in or extended to other workplaces – given Norway's higher bargaining coverage in the telecom industry and national enforcement of data protection rulings. Our interviews in other telecommunications and contact centre companies suggests that the case study described in this paper is a 'best case' rather than a typical case within Germany, in a sector characterized overall by fragmented bargaining and weaker labour

coordination (Doellgast, 2022). We can also speculate on the costs and benefits in the German case of having a strongly codified set of practices or rules for monitoring AI ethics and overseeing the use of workforce analytics. Significant time and resources were required to develop a workable and transparent set of rules and procedures. However, they then seemed more straightforward to enforce and explain to workers, who would then have clear mechanisms to contest or demand information on how their data were used.

What explains the differences between cases? Our findings suggest two main factors, connected to formal and informal institutional differences between the two case studies (as embedded in national institutions). First, co-determination rights and bargaining structures differed in the two cases. In the German case, works councils enjoyed particularly strong co-determination rights over the use of technology in monitoring and managing performance – and many years of experience negotiating comprehensive and detailed agreements regulating the use of these tools. While the Norwegian case is also one in which union power is enshrined in strong co-determination rights, the case at hand shows how fragile even such a system is when confronted with a staunch management strategy to adopt new best-practice monitoring technologies. It also shows the importance of additional institutional structures, in this case the Data Protection Agency, to which trade unions can turn to protect workers' interests.

Second, the different supports for inter-union cooperation on the issue of technological change possibly impacted collective voice. In the German case, the works councils were separate from but closely coordinated with the union. Works councils were also relatively well organised within the company, with regular meetings at local, subsidiary and group levels and activities from one level feeding into initiatives at another. In the Norwegian case, the multiple unions are generally well coordinated. Union cooperation worked well when conflict with management occurred, and unions worked together at different levels to find a solution. However, this process initially only involved unions with members who were affected by video monitoring. Moreover, when we asked union representatives if they were part of broader union projects to discuss issues on regulating AI and digitalisation in other companies or the sector, they said they were not or only informally involved. In contrast, the German case's union had organised cross-industry projects on regulating AI and algorithms at work and participated in regular discussions with other works councils at telecom, contact centre and IT firms about 'best practice' models for negotiating works agreements. Since works councils were responsible for using their co-determination rights to address problems with the day-to-day implementation of technologies, works councillors were more likely to draw on these rights and coordinate with the union to ensure the problems were quickly and formally resolved.

In sum, our findings show that each case drew on different sources of institutional power to regulate how new technologies were adopted, based on protecting worker interests in data protection and discretion. In the German case, works councils benefited from strong formal participation rights on performance-related technology use and a coordinated structure for worker representatives to exchange information and best practices on negotiating over digital technologies. This contributed to a well-organised, forward-looking series of initiatives on regulating algorithmic management. In the Norwegian case, the unions were able to rely on public institutions when the employer did not

cooperate with the formalized system of union-management conflict resolution; which eventually re-established their role and countervailing power in negotiating over monitoring tools and how employee data was used. High union membership and high bargaining coverage overall meant unions had 'associational power', and management was encouraged to cooperate not only to support a cultural commitment to social dialogue but also to avoid strikes and regulatory intervention.

Conclusions

In this paper, we compared different practices for strengthening worker voice in decisions over the use of algorithmic management based on similar case studies in the German and Norwegian telecom industries. Our findings suggest that the combination of broad data protection rules, extensive co-determination rights—particularly exercised by strongly coordinated and union-supported worker representatives—is most likely to support the design of flexible agreements that protect workers from abuse while giving them a say in how the tools are used.

Our findings provide unique insights into both the possibilities for alternative, worker-centric models for regulating algorithmic management and the specific institutions that support worker voice. They suggest that regulations should limit algorithm use rather than leaving these decisions to managers and HR professionals (see Angrave et al., 2016). There are simple ways to mitigate algorithms' negative impacts on workers, including establishing strong data protection guarantees backed by mechanisms to facilitate worker control over the data and ways to keep them anonymous. This includes strictly limiting the use of individual performance data, such as requiring that this data be aggregated to prevent abuses from individualized performance management. Our research also highlights the importance of inter-union coordination. Worker representatives need to be proactive and organize initiatives early in the tech-adoption process to pre-empt workplace issues that may arise from rapidly changing AI technologies.

Globally, legislators are seeking to provide workers with strong rights to data protection. Some such laws have already been implemented, including the GDPR in Europe. Others are being proposed, such as the Assembly Bill 1651 or the Workplace Technology Accountability Act in California. We view legislation as an essential tool to protect worker privacy and to advance equity goals (e.g., Ajunwa et al., 2017). However, our findings suggest that the impacts of legislation will be limited if not combined with strong unions and formal worker rights to participate in management decision making within the firm.

Our case study findings from Germany and Norway demonstrate that collective bargaining and social dialogue can play a central role in the flexible enforcement of formal data protection rules. In each case, these rights derived to some extent from existing and path dependent institutions at national, industry, or firm level. Not all countries have institutional frameworks that safeguard critical workplace rights; moreover, these rights may not be consistent across workers in the core and periphery. Thus, policymakers should be creative in developing new models that enable the broader workforce to exercise influence over the collection and use of their data. One possible alternative is legislation requiring the formation of firm 'joint data protection committees' (Todolí-Signes, 2019). Ideally, these committees would cooperate with unions but extend employee voice rights to non-union workplaces.

Another interesting model involves 'mandating experiments', where companies must test their algorithmic technologies' potential effects on workers before they can enter the market (Bailey, 2021). Such a regulatory framework would function best if worker representatives were involved in its development and implementation, to ensure compliance over time. Ultimately, these different tools are alternative means to strengthen the social regulation of new technology, ensuring that innovations like AI are used to improve the quality of work and enhance trust rather than threatening privacy and intensifying management control.

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