12-9-2022

Algorithmic management and collective bargaining

Valerio De Stefano
Osgoode Hall Law School of York University, vdestefano@osgoode.yorku.ca

Simon Taes
Institute for Labour Law of the KU Leuven, Belgium

etuı.

Algorithmic management and collective bargaining

$SAGE

Valerio De Stefano
York University, Toronto, Ontario, Canada

Simon Taes
Institute for Labour Law of the KU Leuven, Belgium

Summary

This article addresses the challenges raised by the introduction of algorithmic management and artificial intelligence in the world of work, focusing on the risks that new managerial technologies present for fundamental rights and principles, such as non-discrimination, freedom of association and the right to privacy. The article argues that collective bargaining is the most suitable regulatory instrument for responding to these challenges, and that current EU legislative initiatives do not adequately recognise the role of collective bargaining in this area. It also maps current initiatives undertaken by national trade union movements in Europe to govern algorithmic management.

Résumé

Cet article porte sur les défis soulevés par l'introduction de la gestion algorithmique et de l'intelligence artificielle dans le monde du travail, en se concentrant sur les risques que ces nouvelles technologies managériales font peser sur des droits et des principes fondamentaux, tels que la non-discrimination, la liberté d'association et le droit à la protection de la vie privée. L'article fait valoir que la négociation collective constitue l'instrument réglementaire le plus approprié pour répondre à ces défis et que les initiatives législatives actuelles de l'UE ne reconnaissent pas à sa juste valeur le rôle de la négociation collective en la matière. L'article présente également un aperçu des initiatives actuellement mises en œuvre par les mouvements syndicaux nationaux en Europe pour maîtriser la gestion algorithmique.

Zusammenfasung

Dieser Artikel befasst sich mit den Herausforderungen, die durch die Einführung von Management durch Algorithmen und durch künstliche Intelligenz in der Arbeitswelt entstehen. Dabei geht es in erster Linie um die Risiken, die neue Managementtechnologien für grundlegende Rechte und Prinzipien wie Nichtdiskriminierung, Vereinigungsfreiheit und das Recht auf Privatsphäre darstellen. Der Artikel argumentiert, dass Tarifverhandlungen das am besten geeignete Regulierungsinstrument sind, um auf diese Herausforderungen zu reagieren, und dass die aktuellen Rechtsetzungsinitiativen der EU die Rolle von Tarifverhandlungen in diesem Bereich

Corresponding author:
Valerio De Stefano, Osgoode Hall Law School, York University, 4700 Keele St, North York, ON M3J 1P3, Canada.
Email: vdestefano@osgoode.yorku.ca

nicht gebührend anerkennen. Der Artikel gibt ebenfalls eine Übersicht über die derzeit laufenden Initiativen von Gewerkschaftsbewegungen in Europa, um das Management durch Algorithmen einzuhegen.

Keywords
Algorithmic management, algorithmic discrimination, artificial intelligence, employment relationship, platform work, collective bargaining

Introduction

The discussion around the future of work that has become almost ubiquitous in lawmaking and policy-making, and in the media has so far concentrated on 'quantitative' aspects, concerning, for example, how many jobs may be replaced by automation and the introduction of new kinds of technology, such as artificial intelligence (for a legal overview of these sources, see Estlund, 2022; see also Doellgast, 2022: 250–253).

The mainstream discussion neglects a number of issues that are crucial for workers, however. First, it generally ignores the potential role of labour and employment regulation in governing automation processes and their consequences. Even though legislation on collective dismissals, also in the case of technological changes in businesses, is a longstanding feature of employment regulation in many countries, any meaningful discussion of this legislation is absent from the most cited publications about the future of work. Nor do these publications refer to the law and practice of information and consultation with workers' representatives when new technologies or changes in the firms' organisation that could impact the workforce are introduced.

As extensively discussed elsewhere,[1] the mainstream debate also neglects concerns about the 'qualitative' side of technological advances. A widespread assumption is that new technologies will eliminate many monotonous and hazardous jobs, leaving countless workers without employment and enhancing the autonomy and creativity of the few people who would retain an occupation. Still, while it is undeniable that some of these technologies can replace people in carrying out activities that are either menial or dangerous (or both), other innovations may play a more troubling role. Indeed, a panoply of technological devices and IT-powered tracking and monitoring methods is being introduced in workplaces, affecting the conditions under which workers do their jobs and invading their privacy. The data collected are processed to manage the workforce in an automated fashion; decisions concerning hiring and promoting workers and retaining or dismissing them are increasingly shaped or nudged by automatic tools (Aloisi and De Stefano, 2022; De Stefano, 2019; Kellogg et al., 2020).

New technologies can have significant beneficial effects, as already mentioned. But they also pave the way to enhanced and undesirable monitoring and stress at the workplace. Algorithm-based management can also lead to insidious forms of discrimination by hiding the programmers' explicit and implicit biases behind a technologically 'objective' façade. As discussed below, these tools are also used with blatant anti-union aims. Data collection informs management decision-making, not only concerning disciplinary actions, but already during the recruitment of candidates, and thus even before the framing of the employment contract. Therefore, it is vital that trade unions be aware of the risks of algorithmic management and that they plan adequate responses.

---

1 See the contributions in De Stefano V (ed.) (2019) Automation, Artificial Intelligence and Labor Law. *Comparative Labor Law & Policy Journal* 41(1).

For this reason, in 2021 the ETUI and the Institute for Labour Law at the KU Leuven launched a research project involving several trade unions in eight EU countries. This project aimed to reflect on a few questions regarding the role of collective bargaining in algorithmic management. This survey was followed by a conference jointly organised by the ETUI and the Institute for Labour Law at the KU Leuven in March 2022 (the Conference) to exchange trade union experiences on algorithmic management in several EU Member States.[2] This article highlights some of their experiences, strategies and legal actions regarding this phenomenon after discussing some of the tools and practices enabled by artificial intelligence and automated decision-making systems that are increasingly prevalent in the workplace and highlighting their risks.

The idea of algorithmic management

This use of AI tools for tracking and managing workers is also known as algorithmic management or management-by-algorithm. Algorithmic management can also be framed in the broader context of implementing technological tools and digitalised supervision systems to govern and discipline the workforce (Ajunwa et al., 2017; Moore et al., 2018). In a way, this can be considered a form of automation of managerial roles in enterprises (Adams-Prassl, 2019).

One of the crucial components of the proper functioning of these algorithms is a vast amount of data on workers.[3] Data need to be collected from different sources, which implies that almost every worker activity, both online and offline, is, in principle, to be subject to monitoring and tracking. The data are then processed by software to assess workers' productivity and engagement, among other purposes.

Algorithmic management may lead not only to monitoring workers to extents unthinkable in the past but also to collecting and processing an enormous amount of personal data on their lives and work activities. This collection and processing of data by machines exceeds the capacity of any human supervision in the past (De Stefano, 2020: 435). The following sections discuss some applications of these practices.

Tools to track and surveil workers

Modern technologies can track workers' behaviour in several ways. The type of activity that employers intend to monitor impacts the way in which AI tools are implemented.

First, AI tools can track and analyse the physical performance of work. The application of these surveillance instruments may aim to gather workers' whereabouts so that every location, every movement and action are recorded and analysed to make it possible to know how people behave physically when they carry out their work. This type of monitoring can use and combine several tools. Platform work offers various examples of this. By using smartphones and GPS-based applications, platforms can track their couriers or drivers' speed and other location-based variables (De Stefano, 2016: 477). These tracking tools, of course, extend far beyond platform work. Employers also track their workers' location in the workplace through wearables. These devices can record workers' movements, their work pace and their breaks. This tracking may become even more

---

2   A recording of the Conference is available at: https://www.etui.org/events/collective-bargaining -and-algorithmic-management.

3   For a thorough review of common Enterprise Performance Management (EPM) practices carried out by a public authority, see Article 29 Data Protection Working Party (now, the European Data Protection Board), Opinion 2/2017 on data processing at work, adopted on 8 June 2017.

intense by combining these data with data collected by other machines that share the same physical workspace with human workers and require direct physical interaction with them, such as 'collaborative robots' (or 'co-bots') (De Stefano, 2019: 29). 'Sociometric badges' are another example of combining data on people's location and movements with other data regarding, for instance, workers' interaction with their colleagues (Fischbach et al., 2010). Advanced technologies may also be introduced for other purposes, such as time registration. Fingerprints, eye scans, facial scans or other tools for gathering and processing workers' biometric data can be used to record working hours.

Second, people's 'digital' behaviour can also be subject to extensive monitoring. Many workers use computers or other ICT-related technologies to perform their work. Therefore, computer-related activities, such as workers' emails and internal chats, are commonly subject to monitoring (Moore et al., 2018). AI-enabled tools also allow the expansion of surveillance to numerous other 'digital' behaviour components. For instance, they allow the tracking of keyboard strokes, application usage, web history and bandwidth utilisation, and routinely take webcam photos or screenshots of workers' computers (Aloisi and De Stefano, 2021b). These data are then analysed and displayed in a logbook or report made available to managers and supervisors to assess workers' productivity. In these cases, wages are sometimes reduced proportionally to what the software identifies as 'idle time', which often corresponds to when workers are not active on their computers, even if they are completing work tasks offline (Kantor and Sundaram, 2022). They can also be combined with other information on the internet (such as personal information on social media websites) and make or suggest decisions on workers, including about retention or disciplinary action (Adams-Prassl, 2019). They can also predict workers' conduct, such as their intention to apply for another job, have children, or conclude a particular transaction (Zuboff, 2019).

Every type of ITC-based conduct can thus be captured and analysed by algorithms for making decisions about people's work. Notably, the use of surveillance software spiked during the COVID-19 pandemic as many companies reluctantly allowed remote working because of lockdown measures (Aloisi and De Stefano, 2021b; Satariano, 2020). Like other forms of electronic surveillance, these practices are not confined to the employment relationship. For example, crowdworking platforms have long used screenshots and keystroke monitoring to ensure that online freelancers stay on task while paid by the hour. Therefore, this kind of monitoring magnifies and extends management's surveillance and monitoring powers to an extent unthinkable in the past.

Tools to track workers' physical health and mental status

Some technologies in use in today's world of work aim to provide access to workers' health and mental status. For instance, wearable work instruments may be equipped with sensors that measure workers' biometrics and other health-related data, such as heart rate and blood pressure (Fischbach et al., 2010; The Economist, 2018). This means that some wearable devices can track workers' fitness or health status by inferences based on biometric data. Some employers may offer devices, such as Fitbit or access to sleep-tracking platforms, as part of 'wellness programmes' and health benefits (Ajunwa et al., 2017; Lee, 2017). The confidentiality of these data may be compromised when employers gain access.

Moreover, some devices attempt to track even workers' emotional and mental status and their stress levels. This can be done using the above-mentioned 'sociometric badges'. Also, facial scans powered by artificial intelligence are increasingly being used in workplaces, also before people are hired, during job interviews (Ajunwa, 2019). In this context, AI is applied to analyse 'how a person's face moves to determine, for instance, how excited someone seems about a certain work task or how they would behave around angry customers' (Harwell, 2019).

Mental and emotional data are also becoming increasingly available through the application of voice recognition software in microphones. Moreover, access to these data might be facilitated by monitoring workers' brain activities[4] and using other neurotechnological tools (Gonfalonieri, 2020). These forms of neurosurveillance raise enormous ethical issues (De Stefano, 2020: 426).

Tools to make decisions about workers

Managing workers goes beyond surveilling them because monitoring is only one aspect of management. AI-enabled tools also make it possible to take decisions on hiring, directing, evaluating and disciplining workers. Personal data gathered online, also by accessing information available through social networks, are also increasingly being used to make hiring decisions. Automated scanning of CVs is also widely used to hire and promote people, and we have already mentioned the increasing use of AI-powered facial scanning during job interviews (Ajunwa, 2019).

Platform workers are assigned their next task by an app's algorithms, which are also designed to measure workers' speed and diligence in completing the tasks, including by factoring in the rating and reviews that customers assign to them.

Bad scores or performance below the algorithm's standards can lead to workers' exclusion from the platform and thus to 'dismissal' in online and offline platform work (Aloisi and De Stefano, 2022).

Data can also be processed through AI tools that can be used to rate workers on various performance metrics based on poor proxies for productivity (De Stefano and Wouters, 2022). It is important to stress that these practices and tools go beyond the mere surveillance of workers. From hiring to termination, algorithmic management and AI-enabled tools are increasingly being used to manage the workforce, replacing or 'assisting' human supervisors in their activities. At the Conference, several trade union representatives, including speakers from Italy's CGIL and France's Force Ouvrière, mentioned that these tools may lead to contractual changes and significantly alter the relationship between workers and employers. Furthermore, these systems could affect workers' autonomy when they cannot choose their work shifts and algorithms impose their work pace. Because of this relentless evaluation by algorithms workers often experience working days like 'marathons'.[5] Therefore, a comprehensive approach is required to react to the most undesirable uses of these technologies. This is not only about protecting privacy and data rights against invasive surveillance practices, although this remains a fundamental issue. It also calls for reflection on other risks connected to their use and the possible strategies to limit and counter the expansion of the whole set of managerial prerogatives augmented by tech. The following section discusses some of the risks related to algorithmic management.

Risks of algorithmic management

One of the recurrent justifications for introducing algorithmic management practices is that they can help eliminate the individual biases of recruiters and supervisors in managing the workforce

---

4 For instance, one Toronto-based start-up markets 'sensing headbands' that give access to real-time information about brain activities. This company's 'Corporate Wellness Program' already promises to employers to 'help your employees lower stress, increase resilience, and improve their engagement'. See https://choosemuse.com/corporate/ (accessed 2 September 2022).

5 See, for instance, UGT, UGT reclama una Ley europea de Inteligencia Artificial eficiente y justa para las personas trabajadoras, https://www.ugt.es/ugt-reclama-una-ley-de-inteligencia-artificial-eficiente-y-justa-para-las-personas (accessed 2 September 2022).

because such systems apply objective and neutral criteria (Bodie et al., 2017). However, a vast literature already exists refuting this claim and warning of the risk of algorithmic discrimination (Adams-Prassl et al., 2022; Ajunwa, 2019; Eubanks, 2018; Schubert and Hütt, 2019). This can be caused, for instance, by the biases of human developers reflected in these systems (European Economic and Social Committee, 2017). In other cases, algorithmic decision-making systems are too rigid and unable to differentiate among situations that would warrant different decision outcomes. For instance, an Italian Court has recently ruled that the algorithm used by a food-delivery platform was discriminatory because it sanctioned couriers that missed their pre-booked time shifts, even though this could be due to a medical emergency or a constitutionally protected collective action (Aloisi and De Stefano, 2021a).

This risk of biases in AI systems is also associated with a lack of transparency (De Stefano, 2019: 24). Transparency is one of the crucial principles in data privacy law. Therefore, the lack of transparency can lead to unfair processing of workers' data. Moreover, algorithmic management can lead to a very severe intrusion into workers' private lives when AI systems gain access to intimate information on workers (Ajunwa et al., 2017). This raises questions not only about the confidentiality of their sensitive data but also about the quality of the gathered data. For instance, tracking mental states by means of sociometric badges, facial scanning or neurosurveillance tools could also be highly inaccurate and based on biased metrics and data sets, besides being over-intrusive (O'Neill, 2016).

Several trade unions share these concerns about the opacity of these systems. For instance, workers in Germany went on strike because of the lack of transparency of the Amazon worker surveillance systems and the use of algorithms to dismiss workers.[6] At the Conference, trade union representatives from the British TUC, the Spanish UGT and Uni Europa referred to the lack of explanation behind algorithmic decision-making and the need for clarification, explainability and an adequate risk assessment of algorithmic management systems.

There are risks that algorithmic discrimination may propagate beyond the single instance in which it occurs. A low rating assigned by a biased or flawed facial scanning program during an interview, for example, could be recorded in the system and affect future recruitment for the same employer and all the employers using the same program.

It is also unquestionable that all the practices mentioned above are apt to enhance employers' managerial powers and prerogatives in ways unimaginable in the past.

First, the amount of data collected and processed by machines exceeds the capacity of any past human supervision. Also, there is no technical boundary that prevents surveillance from going much beyond working time and tasks – fitness and sleep-tracking apps are just the most evident example in this respect. Union representatives at the Conference, including the speakers from CGIL and Spain's UGT, also observed that algorithmic management could strengthen managers' surveillance by using personal data for different purposes. For example, an order picking system that enabled the employer to monitor the workers' activity in real-time was also used to monitor the amount and duration of bathroom breaks.

The fact that surveillance is continuous, relentless and carried out through a panoply of tools and software that track workers' actions also marks a radical difference from previous techniques. Moreover, contrary to the past, machines are now also entrusted with making decisions about people or suggesting such decisions, also through operating inferences (O'Neill, 2016). Managers and supervisors often ignore how systems operate and, in any case, it is difficult to imagine them

---

6   UNI Global, Following EU data request, amazon workers strike over transparency issues. Available at: https://uniglobalunion.org/news/germany-strike-transparency/ (accessed 2 September 2022).

refusing to follow their suggestions, for fear they may incur disciplinary measures themselves. In this regard, at the Conference, the speakers from Sweden's LO and Poland's Solidarity remarked that employers and managers also need to be adequately trained and guided.

Also, the continuous monitoring of workers may cause an undesirable blurring of work and private life. AI systems collect data on workers at work and outside working hours because of the constant interconnection with IT devices and the internet (De Stefano, 2019: 27). Examples of this include information about workers found on social media or the records of workers' sleeping patterns by wearable devices. Therefore, algorithmic management not only uses data collected during working hours but also processes information on how workers behave when they are not at work. At the same time, these systems can dramatically mistake any work task and activity executed offline, and thus not tracked, as 'idle time' (Kantor and Sundaram, 2022). This not only can produce poor productivity scores that can result in unwarranted disciplinary actions, but it can also amount to outright wage theft when the workers' pay is reduced proportionally to the working time wrongly identified as idle.

Moreover, algorithmic management raises vital issues concerning workers' occupational safety and health. For example, dedicated studies have already argued that workers can experience high stress levels when monitored continuously (Trades Union Congress, 2021a). These practices, therefore, can also imply severe psychosocial risks (De Stefano and Wouters, 2022; Moore, 2019). Several trade union representatives confirmed at the Conference that algorithmic management might have implications for workers' health and safety. The speakers from France's CFDT and Italy's CGIL, for instance, emphasised the impact on workers' mental health when systems determine work pace and the boundaries between work, rest and home become blurred. The speaker from the British TUC observed that trade unions in the UK understand algorithmic management as new technologies that cause old problems, related to the imposition of unrealistic productivity targets, lower wages, intensive management oversight, and insecure working conditions (see Trades Union Congress, 2021b).

All of the above confirms that algorithmic management poses fundamental challenges that go well beyond the question of data protection. Algorithmic management can nullify the distinction between private life and working time, and may have discriminatory implications and detrimental effects on people's well-being. During the Conference, several speakers argued that these psychosocial risks due to the connection between mind and machine need to be addressed in collective agreements. As already discussed, adequate responses to these challenges must consider the entire range of risks that these practices imply and the whole set of managerial prerogatives magnified by technological tools. Crucially, collective responses are also of the essence.

'Negotiating the algorithm': the essential role of trade unions

Collective bargaining and trade union initiatives can be the most effective means of implementing legal safeguards against the risks associated with algorithmic management. Collective rights have traditionally proved essential to adequately limit managerial prerogatives, such as workforce monitoring (Aloisi and Gramano, 2019). Furthermore, scholars have already noted that workers face difficulties asserting their individual rights in the context of algorithmic management systems. For instance, workers may encounter limits on their requests to access their personal data and, consequently, to verify the data processing features of algorithmic management when they receive incomplete or inaccurate information (Aloisi and Potocka-Sionek, 2022). Collective rights can thus materially improve labour protection and remove the obstacles to asserting workers' rights related to algorithmic management. Collective agreements can lay down the specific limits of AI-enabled surveillance on workers (De Stefano, 2020: 440). They can also provide criteria to

improve the transparency of AI-based decision-making processes (Armaroli and Dagnino, 2019; Collins and Atkinson, 2023) to enhance understanding of how their outcomes are reached (Trades Union Congress, 2021a).

Collective bargaining and trade union action are arguably the most effective tools for tackling rapid technological developments in algorithmic management (De Stefano, 2020: 442). Collective agreements can offer solutions for particular challenges in this regard, also at the sectoral and company level. They can cope with these challenges fairly flexibly by taking into account the interests of workers and employers. Collective agreements can also tailor the general principles laid down in legislation and apply them in specific contexts.

For this reason, trade unions in several European countries have started negotiations on algorithmic management. For instance, under a recent agreement concluded by the government and the social partners in Spain, 'digital platforms will have to make available to trade unions an algorithm, or any artificial intelligence of sorts, which may have an impact on such conditions—including individuals' access to, and maintenance of, employment and their profiling. This right to information is granted to everyone working through a platform […] and thus the transparency requirement applies to all digital platforms equally' (Aranguiz, 2021). In this regard, the Spanish trade unions CC OO and UGT concluded an agreement with a food-delivery platform (Aguilar, 2021). This agreement included information rights for employees about all AI systems used at work. Furthermore, it prohibits any profiling of workers and establishes a communication channel between workers and trade unions within the platform that cannot be monitored. In addition, workers' representatives and the company staff created a commission to manage the algorithms. Finally, the trade unions should be given access to crucial information about the algorithmic management system: the identity of the program developer and implementer of the system (and their legal roles of controller or processor), a description of the type and objectives of the system (recommendation, risk assessment, supervised/unsupervised system), details of the training data and variables used, the impact study and the independent external audit and the outcome of complaints measures.

In the United Kingdom, trade unions have negotiated agreements establishing sub-committees to examine data processes and a commitment not to use technology as a tool to dehumanise the workplace, to guarantee that managers remain key decision-makers, to define an agreed productivity measure and to safeguard the use of data following existing data policies and UK data protection legislation.

In Italy, CGIL, CISL and UIL negotiated an agreement with a food-delivery platform that also addresses algorithmic management practices.[7] The same trade unions also signed a local collective agreement with the employers' associations in the cooperative sector; this agreement sets out information rights when AI-based systems are introduced at the workplace and provides that human oversight over technology should be maintained by limiting automated decision-making systems.[8]

Most notably, in 2022, the European social partners reached a preliminary programme on European social dialogue. The programme expressly refers to the challenges that digital monitoring presents to workers' privacy in the context of remote work and states: 'monitoring and surveillance tools should only be used where necessary and proportionate and the workers' right to privacy should be ensured. […] Due to the accelerated rate of adoption of workplace technologies which have monitoring and surveillance capabilities, social partners need to create the space for

---

7   CGIL, Accordo tra CGIL CISL UIL e just eat primo importante passo. Available at: https://www.nidil. cgil.it/rider-accordo-tra-cgil-cisl-uil-e-just-eat/ (accessed 2 September 2022).

8   Copy (in Italian) with the authors.

exchanging views on these trends and the relevance this has for social partners and collective bargaining at all appropriate levels across Europe.'

It remains to be seen how this programme will be implemented. It is clear, however, that 'negotiating the algorithm' is increasingly becoming a core interest of the European labour movement.

The importance of collective agreements in processing data rights and governing algorithmic decision-making is also recognised in Article 88 of the EU General Data Protection Regulation (De Stefano, 2020: 441). This article defines collective agreements as essential for fair and lawful data processing in the context of employment. It refers explicitly to data processing for recruitment and management purposes, which means that collective agreements could provide adequate safeguards when AI-enabled tools and algorithmic management practices are implemented in workplaces (Armaroli and Dagnino, 2019; Hendrickx, 2018). For example, they can require information on how employers use workers' data and how AI systems process data (Trades Union Congress, 2021a). They could also ban the most intrusive technological applications, including neurosurveillance (De Stefano, 2020). Nonetheless, at the Conference, the speaker of the French Force Ouvrière considered that Article 88 is incomplete and may not be able to respond appropriately to the concerns of labour – accordingly, codes of conduct should be used to negotiate the introduction of AI systems in workplaces (FO-Cadres, 2021; Madinier, 2022: 20).

In any case, as already discussed, the introduction of AI and algorithmic management into the workplace enables the most pervasive monitoring of workers' activities and performance, and triggers risks of unfettered exploitation, discrimination and OSH hazard to a level that even most employers would find hard to comprehend. In this respect the engagement of collective actors is vital. Moving from the collective agreements just discussed, workers' representatives and unions must be increasingly involved in the decision-making that leads to the definition and implementation of algorithmic management systems. Collective agreements can crucially mitigate the risks of AI-enabled surveillance and automated decision-making. They can incorporate workers' interests and emphasise the need for essential safeguards to protect fundamental labour rights. Moreover, they may offer the required flexibility to cope with the sector- and company-specific application of technologies. The *ex-ante* governance allowed by collective negotiations over technological developments is unquestionably more effective than an *ex-post* damage-control approach, given the transformative use of technology in the world of work.

Collective bargaining can also be accompanied and supplemented by other forms of trade union involvement. Doellgast et al. (2023) have documented how worker representatives in the telecommunications sectors in Germany and Norway have used not only collective bargaining but also information and consultation mechanisms and litigation to shape the use of algorithms at work. When encountering opposition from management, the Norwegian trade unions successfully challenged an algorithmic monitoring system before the national data protection authority.

This shows how trade union initiatives to govern and restrain algorithmic management can also go beyond collective bargaining and satisfactorily include co-determination instruments and strategic litigation. Concerning the latter, some national trade union movements have been pioneers in challenging algorithmic systems in court by filing claims to protect both the collective and individual rights of workers.

For instance, some UK-based Uber drivers, backed by the App Drivers and Couriers Union (ADCU) and the International Alliance of App-based Transport Workers (IAATW), challenged their removal from the platform before a Dutch court and obtained the right to an explanation of algorithmic processes based on the EU GDPR (Lomas, 2021). As already mentioned, the Italian CGIL supported a claim against a food-delivery platform that resulted in the court finding discrimination on both medical and strike-related grounds.

Strategic litigation is certainly not a new phenomenon, and trade unions have long included it in their arsenal. These new developments show that trade union initiatives can protect and bolster individual employment rights that can be jeopardised by algorithmic management also through litigation.

Various trade unions have also examined existing legislation on information and consultation of workers to establish collective bargaining regarding algorithmic management. For instance, the Swedish trade union representative at the Conference referred to an assessment of the Swedish Act on co-determination in the workplace that provides the right to interact and negotiate with the employer when the workplace is significantly changed.[9] In Germany, lawmakers addressed the need for the involvement of trade union representatives concerning the introduction of AI-based systems at work by modernising the regulation of works councils (in the Works Council Modernisation Act). The works councils must assess the introduction or application of AI and may involve an expert in this assessment (Klengel and Wenckebach, 2021: 165). In Poland, a bill was introduced in Parliament to incorporate the right to information about algorithms in the Act on Trade Unions.[10] In the United Kingdom, recent amendments to the regulation governing information and consultation could also facilitate collective discussion on the adoption and use of new technologies at work.

Trade unions must arguably increase awareness of algorithmic management among their ranks to start meaningful collective negotiations, to exercise rights such as information and consultation successfully, or to flag potential cases for litigation. However, as discussed extensively at the Conference, workers' representatives generally do not have expertise in algorithmic management. For this reason, several trade unions have developed training strategies and plans.

First, they made reports and other documents available to inform their members of the risks and consequences of algorithmic management. For instance, UNI Global published guides to help workers and trade unions better understand some relevant technologies and provide guidance on how to negotiate on the development of algorithmic management tools (Briône, 2020; Delfanti et al., 2021). The Spanish trade union UGT also published reports that emphasise the need to regulate algorithms in labour relations to guarantee the quality of the data collected and avoid biases. In this regard, the UGT reports recommend different stages for negotiating the use of algorithms in the workplace: (i) negotiations on the need, purpose and proportionality of the system; (ii) agreement on the tools and applications to be used; (iii) agreement on the implementation design; (iv) impact assessment regarding data protection; (v) co-execution of the plan; and (vi) monitoring of the implementation and readjustments.[11]

Some trade unions also took a rather institutionalised approach to organising these activities. For instance, Italy's CGIL created an Office on Industry 4.0 that manages initiatives on algorithmic decision-making processes.[12] In the United Kingdom, the TUC launched a task force on AI,

9   Ministry of Employment, (Non-official) translation Co-Determination in the Workplace Act. Available at: https://www.government.se/government-policy/labour-law-and-work-environment/1976580-employment-co-determination-in-the-workplace-act-lag-om-medbestammande-i-arbetslivet/ (accessed 2 September 2022).

10 AlgorithmWatch, Plan to incorparate the right to information about algorithms in the Act on Trade Unions. Available at: https://algorithmwatch.org/en/awow-db/plan-to-incorparate-the-right-to-information-about-algorithms-in-the-act-on-trade-unions/?awow_workrelatedfocus=algorithmic-management&country=poland (accessed 2 September 2022).

11 UGT, Las decisiones algorítmicas en las relaciones laborales, https://www.ugt.es/sites/default/files/no_20_-_210208_las_decisiones_algoritmicas_en_las_rrll.pdf (accessed 2 September 2022).

12 CGIL, Cos'è il progetto lavoro 4.0, https://www2.cgil.it/cose-progetto-lavoro-4-0/ (accessed 2 September 2022).

produced reports (Trades Union Congress, 2020, 2021b) and drafted a Manifesto identifying gaps in legislation and recommending improving trade union consultation and the right to transparency and explainability, developing the right to human review and safeguarding human engagement (Trades Union Congress, 2021a).

In Sweden, organisations run jointly by the social partners offer employers and workers guidance on the working environment and health and safety issues related to algorithmic management and develop toolboxes for digital workplaces.[13] The above-mentioned local collective agreement in Italy also mentions the importance of training concerning technological innovation.

The initiatives mentioned show that trade unions and employers' associations in Europe are increasingly aware of the challenges that algorithmic management poses to labour and employment rights and have started to tackle these challenges either unilaterally or together. In doing so, they will also be materially influenced by the legislative measures dealing with artificial intelligence and automated decision-making at work adopted at the national and EU level. The following section discusses the more prominent legislative proposals of the European Union in this field.

The European approach to algorithmic management

In 2021 the European Commission proposed an EU Regulation on a European Approach to Artificial Intelligence.[14] Recital 35 of the draft Regulation states that 'AI systems used in the recruitment, task allocation or evaluation of workers may appreciably impact workers' future career prospects and livelihood and should also be classified as high-risk'. The proposal also pays heed, very generically, to the potentially discriminatory impact of AI in the world of work and its risks to workers' privacy. However, it neglects the importance of strengthening collective rights – discussed in the previous section – for dealing with the risks related to AI systems and algorithmic management.

While it is appropriate to classify AI systems used in the context of work as high-risk, the draft Regulation is far from sufficient to protect workers adequately.

First, it mentions 'AI systems [that are] intended to be used for recruitment – for instance in advertising vacancies, screening or filtering applications, evaluating candidates in the course of interviews or tests – as well as for making decisions on promotion and termination of work-related contractual relationships, for task allocation and monitoring and evaluating work performance and behaviour'.[15]

As we have just said, it provides that these systems shall be classified as high-risk and therefore subject to specific safeguards. At the same time, however, it mentions that the assessment of these systems' conformity will be subject to 'self-assessment by the provider'. This is, disappointingly, a lower level of safeguard than applies to those high-risk systems that require 'stricter conformity assessment procedures through the involvement of a notified body'. In this regard, introducing an *ex-ante* assessment by third parties instead of a self-assessment would be paramount (De Stefano and Wouters, 2022: 54). Given the extraordinarily substantial and severe consequences these

---

13   Suntarbetsliv, Digi-ronden, https://www.suntarbetsliv.se/digironden/ (accessed 2 September 2022); Prevent, For a better working day. Available at: https://www.prevent.se/om-prevent/for-a-better-working-day// (accessed 2 September 2022).

14   Proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (Artificial Intelligence Act) and amending certain Union legislative acts, COM(2021) 206 final, 21 April 2021, Brussels.

15   Annex II, 3.

systems can entail, it is also highly problematic that this draft provision was not subject to any form of social dialogue at the EU level. It has also been argued the Act should enable worker representatives to access data sets used to train, test and validate data to prevent discrimination, something that it dramatically fails to do (Klengel and Wenckebach, 2021: 167).

Moreover, the draft Regulation has a 'liberalising' legal basis and seems to take it for granted that if AI systems used at work comply with the procedural requirements it sets forth, these systems should be allowed. As discussed above, using AI to hire, monitor (and, therefore, surveil) and evaluate 'work performance and behaviour' is highly problematic. Several EU national legislations ban or severely limit the use of tech tools to monitor workers (Aloisi and Gramano, 2019). We have also already mentioned the new Spanish and German provisions on algorithmic transparency and AI at work. If adopted, however, the draft Regulation risks prevailing over this more restrictive legislation and triggering a deregulatory landslide in labour and industrial relations systems around Europe. This is all the more serious because these national legislations often require trade union involvement before introducing any form of tech-enabled surveillance, while the draft Regulation does not specifically mention the social partners and their roles in regulating AI systems.

If the draft Regulation is not amended, the more protective national legislation risks being superseded by this EU instrument: this Regulation, in other words, risks functioning as a ceiling rather than a floor for labour protection.

The draft Regulation also does not explicitly consider the need to provide specialised training for people entrusted with the control and operation of AI systems at work, as well as powers to counter the specific implications of the use of these systems in the context of work. Again, any national legislation providing more safeguards and protection risks being trumped by the Regulation (De Stefano and Wouters, 2022: 55).

In December 2021, the European Commission also proposed a draft Directive on improving working conditions for platform work. The draft aims to complement existing personal data legislation and foster social dialogue by introducing collective rights 'regarding information and consultation on substantial changes related to the use of automated monitoring and decision-making systems'.[16] Accordingly, it provides specific information duties vis-à-vis workers and their representatives on algorithmic monitoring and automated decision-making systems used to take or support decisions that significantly affect platform workers' working conditions. The Directive also provides the right to obtain an explanation of these decisions and the criteria on which they were adopted.

While the draft represents a step forward, particularly compared with the proposed Regulation on AI, it arguably still falls short of providing adequate protection. For instance, although the Directive reinforces information rights regarding algorithmic management systems on platforms, several trade union representatives at the Conference mentioned that these rights may not enable access to information on the design of the algorithms themselves. The Directive, moreover, seems to consider algorithmic monitoring and surveillance as a given. This is particularly problematic because these forms of technological supervision would thus be subject, at the EU level, to significantly looser standards than those that several EU Member States have imposed on much less invasive surveillance systems, such as video cameras, in the past (Aloisi and Gramano, 2019).

---

16   Explanatory memorandum of the proposal for a Directive of the European Parliament and of the Council on improving working conditions in platform work, 9 December 2021, 3–4.

The draft Directive also applies only to platform work, leaving workers in all other sectors potentially covered only by the much less protective measures of the draft AI Regulation and the GDPR. In 2022, a European Parliament Report suggested strengthening the Directive's provisions on algorithmic management and extending them to workers in all sectors. It is hard to predict how the negotiations between the European Parliament, the Commission and the Council will settle this topic. It is undeniable, however, that leaving the vast majority of European workers largely unprotected against the same instruments that will be governed by novel EU legislation would scarcely be justifiable.

Conclusions

In 2018, one of the authors of this article (De Stefano, 2019), after highlighting the risks and challenges of the introduction of AI-based and algorithmic management systems at work, expressed the hope that 'negotiating the algorithm' would become a central objective of social dialogue and action for trade union movements and the social partners in general. A few years later, the collective initiatives around algorithmic decision-making in the world of work are, especially in Europe, a discernible reality that it is to be hoped will keep on developing. Legislative actions have also followed suit, even though, as discussed in this contribution, they arguably so far leave much to be desired.

This article has mapped some of the practices made possible by AI-enabled and algorithmic-based systems that are increasingly affecting the world of work. It has also discussed how these systems affect both blue- and white-collar occupations, regardless of the employment status of the workers affected by them. It has also highlighted the risks these systems pose to working conditions and labour rights, including discrimination, severe invasions of privacy, union-busting, and occupational health and safety hazards.

Given their implications for so many dimensions of work and life, we have also argued that adequate responses to these risks should not be confined to individual rights and aspects, but should aim also to limit employers' managerial prerogatives as augmented by these systems. Collective labour rights and trade union initiatives are essential here because they make it possible to respond to employers' powers and initiatives comprehensively and to tailor responses to the reality of the sector or the company. Collective agreements, information and consultation rights, and co-determination also enable *ex-ante* controls on the introduction of new technologies and limit risks and abusive practices. This article has also documented an increasing number of these collective initiatives in Europe. As argued above, *ex-post* strategic litigation pursued by trade unions can complement and enrich *ex-ante* instruments.

Legislation can either support or thwart all these collective developments and actions, depending on its design and content. In the last section, we discussed the potential role of some EU legislative proposals in this field. Overall, we argued, these proposals need material amendments to be effective or even to avoid limiting trade union action in this field dramatically.

It is certain, however, that AI and algorithmic management systems, and their governance, will be a crucial issue for social dialogue, industrial conflict and labour regulation and an essential topic of labour and employment law and relations for a long time. We hope that this article, together with the other contributions to this issue, will help navigate these tumultuous waters as we go forward.

References

Adams-Prassl J (2019) What if your boss was an algorithm? Economic incentives, legal challenges, and the rise of artificial intelligence at work. *Comparative Labor Law & Policy Journal* 41(1): 123–146.

Adams-Prassl J, Binns R and Kelly-Lyth A (2022) Directly discriminatory algorithms. *Modern Law* 86(1): 144–175.

Aguilar R (2021) Just Eat and unions sign the first company agreement for riders in Spain. *Spain's News*. Available at: https://spainsnews.com/just-eat-and-unions-sign-the-first-company-agreement-for-riders-in-spain/ (accessed 2 September 2022).

Ajunwa I (2019) An Auditing Imperative for Automated Hiring. SSRN. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3437631 (accessed 16 May 2022).

Ajunwa I, Crawford K and Schultz J (2017) Limitless worker surveillance. *California Law Review* 105(3): 735–776.

Aloisi A and De Stefano V (2021a) Frankly, my rider, I don't give a damn. *Rivista il Mulino*. Available at: https://www.rivistailmulino.it/news/newsitem/index/Item/News:NEWS_ITEM:5480 (accessed 2 September 2022).

Aloisi A and De Stefano V (2021b) Essential jobs, work-from-home and digital surveillance: Is the Covid-19 pandemic panopticon here to stay? *International Labour Review* 161(2): 289–314.

Aloisi A and De Stefano V (2022) *Your Boss is an Algorithm. Artificial Intelligence, Platform Work and Labour*. Oxford: Hart Publishing.

Aloisi A and Gramano E (2019) Artificial intelligence is watching you at work: Digital surveillance, employee monitoring, and regulatory issues in the EU context. *Comparative Labor Law & Policy Journal* 41(1): 95–122.

Aloisi A and Potocka-Sionek N (2022) De-gigging the labour market? An analysis of the 'algorithmic management' provisions in the proposed Platform Work Directive. *Italian Labour Law E-Journal* 15(1): 29–50.

Aranguiz A (2021) Spain's platform workers win algorithm transparency. *Social Europe*. Available at: https://www.socialeurope.eu/spains-platform-workers-win-algorithm-transparency (accessed 16 May 2022).

Armaroli I and Dagnino E (2019) A seat at the table: Negotiating data processing in the workplace. *Comparative Labor Law & Policy Journal* 41(1): 173–196.

Bodie MT, Cherry MA, McCormick ML et al. (2017) The law and policy of people analytics. *University of Colorado Law Review* 88(10): 961–1018.

Briône P (2020) *Algorithmic management: A trade union guide*. Report for UNI Professionals and Managers. Nyon, Switzerland: UNI Global Union.

Collins P and Atkinson J (2023) Worker voice and algorithmic management in post-Brexit Britain. *Transfer: European Review of Labour and Research* 29(1): 37–52.

De Stefano V (2016) The rise of the 'just-in-time workforce': On-demand work, crowdwork and labour protection in the 'gig-economy'. *Comparative Labor Law & Policy Journal* 37(3): 471–503.

De Stefano V (2019) Negotiating the algorithm: Automation, artificial intelligence, and labor protection. *Comparative Labor Law & Policy Journal* 41(1): 15–46.

De Stefano V (2020) 'Masters and servers': Collective labour rights and private government in the contemporary world of work. *International Journal of Comparative Labour Law and Industrial Relations* 36(4): 435–443.

De Stefano V and Wouters M (2022) *AI and digital tools in workplace management and evaluation: An assessment of the EU's legal framework*. Report for the Panel for the Future of Science and Technology. Brussels: European Parliament.

Delfanti A, Radovac L and Walker T (2021) *The Amazon panopticon: A guide for workers, organisers & policymakers*. Report for UNI Global. Nyon, Switzerland: UNI Global Union.

Doellgast V (2022) *Exit, Voice, and Solidarity: Contesting Precarity in the US and European Telecommunications Industries*. Oxford: Oxford University Press.

Doellgast V, Wagner I and O'Brady S (2023) Negotiating limits on algorithmic management in digitalised services: cases from Germany and Norway. *Transfer: European Review of Labour and Research* 29(1): 105–120.

Estlund C (2022) *Automation Anxiety. Why and How to Save Work*. Oxford: Oxford University Press.

Eubanks V (2018) *Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor*. New York, NY: St. Martin's Press.

European Economic and Social Committee (2017) Opinion of the European Economic and Social Committee 'Artificial intelligence – The consequences of artificial intelligence on the (digital) single market, production, consumption, employment and society' (own-initiative opinion). OJ C 288. 31.8.2017, pp. 1–15.

Fischbach K, Gloor PA, Lassenius C et al. (2010) Analyzing the flow of knowledge with sociometric badges. *Procedia – Social and Behavioral Sciences* 2(4): 6389–6397.

FO-Cadres (2021) La lettre FO-Cadres: Numérique et intelligence artificielle : du télétravail à la gestion algorithmique dans les pratiques RH. Available at: https://www.fo-cadres.fr/content/uploads/2021/04/L179-FO-CADRES-MARS21-4e-couv-APEC_web.pdf (accessed 2 September 2022).

Gonfalonieri A (2020) What brain-computer interfaces could mean for the future of work. *Harvard Business Review*, 6 October. Available at: https://hbr.org/2020/10/what-brain-computer-interfaces-could-mean-for-the-future-of-work (accessed 2 September 2022).

Harwell D (2019) A face-scanning algorithm increasingly decides whether you deserve the job. *The Washington Post*, 6 November. Available at: https://www.washingtonpost.com/technology/2019/10/22/ai-hiring-face-scanning-algorithm-increasingly-decides-whether-you-deserve-job/ (accessed 2 September 2022).

Hendrickx F (2018) Privacy, data protection and measuring employee performance. The triggers from technology and smart work. *Global Workplace Law & Policy*. Available at: http://global-workplace-law-and-policy.kluwerlawonline.com/2018/03/21/privacy-data-protection-and-measuring-employee-performance-the-triggers-from-technology-and-smart-work/ (accessed 2 September 2022).

Kantor J and Sundaram A (2022) The rise of the worker productivity score. *The New York Times*, 14 August. Available at: https://www.nytimes.com/interactive/2022/08/14/business/worker-productivity-tracking.html (accessed 2 September 2022).

Kellogg KC, Valentine MA and Christin A (2020) Algorithms at work: The new contested terrain of control. *Academy of Management Annals* 14(1): 366–410.

Klengel E and Wenckebach J (2021) Artificial intelligence, work, power imbalance and democracy – why co-determination is essential. *Italian Labour Law e-Journal* 14(2): 157–171.

Lee SM (2017) Workplaces are tracking their employees' sleep. *Buzzfeed. News*. Available at: https://www.buzzfeednews.com/article/stephaniemlee/work-wellness-program-of-the-future-will-track-your-sleep (accessed 2 September 2022).

Lomas N (2021) Dutch court rejects Uber drivers' 'robo-firing' charge but tells Ola to explain algo-deductions. *TechCrunch*. Available at: https://techcrunch.com/2021/03/12/dutch-court-rejects-uber-drivers-robo-firing-charge-but-tells-ola-to-explain-algo-deductions/?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAANLdvJf0jNmABZ-SfZeHW-6S8f3Fi3Cf26O-b1TSiIL4-hkQu-MbWg_cXjzajvJEhVHA9Chl521-h1qdLeMtGG9L3AhPvn8qT-cluHELuu_TRmv5jUFq7wg–QxAoSIbeNtz67t8ZQKaC13NVt8PGzIAaD4D9uJj0bLhScE3QzfuN (accessed 2 September 2022).

Madinier FS (2022) *A Guide to Artificial Intelligence at the Workplace: Your Rights on Algorithms*. Brussels: European Economic and Social Committee.

Moore P (2019) OSH and the Future of Work: Benefits and risks of artificial intelligence tools in workplaces. EU OSHA discussion paper. Available at: https://osha.europa.eu/en/publications/osh-and-future-work-benefits-and-risks-artificial-intelligence-tools-workplaces (accessed 2 September 2022).

Moore P, Akhtar P and Upchurch M (2018) Digitalisation of work and resistance. In: Moore P, Upchurch M and Whittaker X (eds) *Humans and Machines at Work: Monitoring, Surveillance and Automation in Contemporary Capitalism*. Cham, Switzerland: Palgrave Macmillan, pp. 45–73.

O'Neill C (2016) *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy*. New York, NY: Crown Publishers.

Satariano A (2020) How my boss monitors me while I work from home. *New York Times*, 7 May.

Schubert C and Thorsten Hütt MT (2019) Economy-on-demand and the fairness of algorithms. *European Labour Law Journal* 10(1): 3–16.

The Economist (2018) The workplace of the future. *The Economist*, 28 March.

Trades Union Congress (2020) *Technology Managing People: The Worker Experience*. London: Trades Union Congress.

Trades Union Congress (2021a) *Dignity at Work and the AI Revolution*. London: Trades Union Congress.

Trades Union Congress (2021b) *When AI is the Boss: An Introduction for Union Reps*. London: Trades Union Congress.

Zuboff S (2019) *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*. New York, NY: Public Affairs.