Regulating Algorithmic Management at Work in the European Union: Data Protection, Non-discrimination and Collective Rights

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In recent years, algorithmic management practices have been widely adopted by employers to monitor remote work, analyse how applicants behave during job interviews, rate worker performance and calculate wage adjustments. As a result, the condition of workers being subjected to the upstream authority of managers has intensified. Employment protection legislation recognizes the importance of curbing the employer's unilateral discretionary power by deploying several controlling factors. However, the traditional guardrails have now been displaced by the transformative impact of data-driven technologies. As a response to this challenge, several measures implemented by the European Union (EU) could be pragmatically adapted to curtail the expansion of artificial intelligence-based management prerogative.

By applying a multidimensional, anticipatory and participatory approach, this paper integrates substantive and procedural rules that contribute to rebalancing informational asymmetries within workplaces and assesses the effectiveness of these rules. Examining case law, administrative decisions and legislative developments, it also discusses the mutually reinforcing relationship between data protection and anti-discrimination measures, which renders automated decisions documentable and contestable. In addition to defensive tactics, this article calls for the involvement of worker representatives in co-designing digital human resource policies. As data are relational, collective bodies are uniquely placed to exchange information, raise awareness and bring claims, with a view to preventing the improper use of algorithms.

Keywords: Employer Powers, Data Protection, Non-Discrimination, Co-Determination, Artificial Intelligence, Management by Algorithm, Right to Explanation, Burden of Proof, EU Law, Digital Transformation

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1 INTRODUCTION

The ongoing digital transformation is taking on unparalleled forms in contemporary workplaces. Day-to-day functions once completed by mid-level managers are increasingly being delegated to data-driven applications capable of screening résumés, assigning jobs, assessing performance, forming teams, setting incentives and imposing sanctions. This is arguably one of the most revolutionary aspects of automation that, contrary to conventional wisdom, does not lead to widespread unemployment.[1] Rather, it promotes the gradual entrusting of decision-making to non-human agents. Understood as a set of socio-technical practices supporting, complementing or supplanting human decision-making thanks to big data harvesting and ubiquitous computing, algorithmic management is gaining traction in business and attention in scholarship and public opinion.[2]

Due to their magnitude, the challenges posed by this phenomenon span numerous thematic fields. One of the aims of labour law has always been to moderate the unilateral discretionary power of the dominant contractual party by deploying controlling factors at the collective and individual levels.[3] Today, however, its ability to deliver on this key function is under strain as a result of the expansion of the decision-making power of employers.[4]

Management by algorithm has often been examined in its constitutive phases and analysed from a narrow perspective, typically using field-specific viewpoints.[5] In addition, the existing literature has mainly provided retrospective or complaint-led responses. Both postures are reasonable when prompted by the need to reduce complexity and restore those subject to abusive practices, although they entail drawbacks that this article aims to overcome using a multidimensional, preventive and collective approach. This study focuses on instruments capable of proactively fostering equality and accountability to curb the expansion of domination.[6] Accordingly, the human resource management (HRM) techniques powered by

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1 David H. Autor, *Why Are There Still so Many Jobs? The History and Future of Workplace Automation*, 29 J. Econ. Persp. 3–30 (2015).

2 Sara Baiocco, Enrique Fernández-Macías, Uma Rani & Annarosa Pesole, *The Algorithmic Management of Work and Its Implications in Different Contexts*, European Commission (2022); Alex J. Wood, *Algorithmic Management Consequences for Work Organisation and Working Conditions*, JRC Working Papers Series, WP No. 7 (2021); Alexandra Mateescu & Aiha Nguyen, *Algorithmic Management in the Workplace*, Data & Society (2019).

3 Otto Kahn-Freund, *Labour and the Law* (Stevens & Sons 1972).

4 Matthew T. Bodie, Miriam A. Cherry, Marcia L. McCormick & Jintong Tang, *The Law and Policy of People Analytics*, 88 U. Colo. L. Rev. 2–79 (2016).

5 Alex Rosenblat & Luke Stark, *Algorithmic Labor and Information Asymmetries: A Case Study of Uber's Drivers*, 10 Int'l J. Comm. 3758–3784 (2016).

6 Sandra Fredman, *Making Equality Effective: The Role of Proactive Measures*, European Commission, Directorate-General for Employment, Social Affairs and Equal Opportunities, Unit EMPL/G/2 (2010).

technology are examined by considering their effects on bargaining and informational dynamics at the workplace level. This issue is relevant to worker-protective measures intended to 'proceduralize' the exercise of employer power.

The main aim of this article is to examine the suitability of certain European Union (EU) measures when it comes to rationalizing the authority associated with the day-by-day management of employment relations. Several constraints have been introduced by legal norms to temper the undue expansion of management power. Disturbingly, most of these countervailing forces are limited by the fact they were designed in response to forms of power that were significantly different from and less sophisticated than today's technocratic authority. However, EU law offers solutions that taken together may contribute to rebalancing power in the workplace.[7] This can be achieved by means of a convergence towards more encompassing and dissuasive strategies. Expanding on labour law premises, this article aims to reconnect seemingly unconnected legal domains such as data protection and non-discrimination, by examining case law, administrative decisions and recent legislative developments. To overcome the limitations of these fields, this article considers employee involvement as a 'force multiplier' in three guises: (1) the collective negotiation of the adoption and development of algorithmic tools at work, (2) knowledge sharing with a view to promoting fact-finding and litigation, (3) the co-design of data-driven company practices to ensure that they are worker-centred.

The remainder of this paper is organized as follows. Section 2 briefly examines the role of managerial prerogatives and contends that the existing statutory and collectively negotiated limits have been seriously undermined by the intensification of employer power. Drawing on cases of strategic litigation, section 3 offers a unified reading of the EU General Data Protection Regulation (GDPR) provisions and anti-discrimination measures, thanks to which automated decisions can be made legible and contestable, thus eradicating algorithmic bias. Crucially, this article shifts the focus from the inner workings of 'black boxes' to the consequences they engender, presenting robust opportunities for redress. Since one limitation of current strategies is the narrow framing of the two fields, this section pragmatically exemplifies techniques promoting worker involvement in shaping, adapting and challenging HRM policies in order to reduce the power gap at work. Section 4 concludes.

[7] Ljupcho Grozdanovski, *In Search of Effectiveness and Fairness in Proving Algorithmic Discrimination in EU Law*, 58 CML Rev. 99–136 (2021).

2 THE TRANSFORMATIVE IMPACT OF WORKPLACE TECHNOLOGIES

Due to the near-constant collection and processing of data, algorithmic management affects an ever-increasing number of workers who find themselves recruited, governed, monitored and fired by digital applications, whose decisions are inscrutable, unpredictable and difficult to contest using traditional resources. Algorithms are widely adopted in factories, stores and (home) offices to impose metrics that guide and appraise performance. The grey literature may be blossoming,[8] but the reporting is often anecdotal. However, the ongoing shift is proving challenging, even when compared with trends prioritized in judicial and policy action, such as 'platformization'.[9]

Numerous workers are witnessing the expansion of the range, velocity and severity of the managerial prerogatives legally conferred on employers within the standard employment relationship (recruitment, organization, monitoring, discipline). In addition, the traditional employer-worker relationship is developing beyond its original boundaries.[10] As a result, the condition of subjection to authority is intensified by digital devices, and extended to include even self-employed and other non-standard workers who should in principle enjoy a greater degree of autonomy.

Various factors make it hard to grasp the rise of 'algorithmic management', as this new managerial model is known in common parlance. First, the rise of management by algorithm takes place by means of a slow, varied and gradual makeover unfolding at different paces in different industries. Second, and more worryingly, this process is almost imperceptible and, by definition, faceless, involving characteristics that can have a chilling effect on individual awareness and collective resistance. This makes it harder to deal with grievances, both for those whose working lives are dominated by these systems, and for the courts required to examine cases. Third, algorithmic management seems at first sight to be innocuous, and is often presented as a magic wand for solving problems relating to human subjectivity, administrative bottlenecks, the absence of fairness and systematic disparities in regular workplaces. Although these claims have been demystified,[11]

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8 Jodi Kantor & Arya Sundaram, *The Rise of the Worker Productivity Score*, The New York Times (15 Aug. 2022), https://nyti.ms/3B8l7sV (accessed 20 Mar. 2023); Kevin Roose, *A Machine May Not Take Your Job, But One Could Become Your Boss*, The New York Times (23 Jun. 2019), nyti.ms/32d0NBV (accessed 20 Mar. 2023).

9 Antonio Aloisi, *Platform Work in Europe: Lessons Learned, Legal Developments and Challenges Ahead*, 13 Eur. Lab. L.J. 4–29 (2022).

10 Cynthia Estlund, *Rethinking Autocracy at Work*, 131 Harv. L. Rev. 795–826 (2017).

11 Frank Pasquale, *The Black Box Society: The Secret Algorithms that Control Money and Information* 212 (Harvard University Press 2015).

they represent a potent narrative contributing to the development of complaisant attitudes.

Prior to examining solutions from the EU social *acquis* and assessing their effectiveness, it is essential to highlight the main differences between traditional authority and new forms of managerial prerogative. The following subsections provide some examples corroborating the notion of the ongoing expansion of employer power. This qualitative leap becomes controversial if it displaces the rules on which labour regulation is premised, eroding its values and reducing the opportunities to challenge abuses.

2.1 Automated decision-making and the rise of employer power

Algorithms can be described as complex sets of instructions supported by advanced statistics and fuelled by increased computational power, intended to maximize efficiency with regard to assigning tasks, categorizing items, targeting messages, allocating resources and forecasting events. Broadly understood, artificial intelligence (AI) is an umbrella term covering several applications,[12] whether standalone or embedded in everyday instruments, that mimic capabilities associated with humans when trained using a large set of readable data.[13] As a subspecies of AI, machine learning (ML) can autonomously develop capabilities 'by example and by doing' and redesign procedures to pursue implied objectives in an astoundingly cost-effective and adaptive fashion.[14]

From a legal perspective, another concept needs to be introduced. 'Automated decision-making systems' (ADMS) consist of processes in which discrete choices are made partially or solely by software based on probabilistic determinations. ADMS operate in a wide range of sectors, including education, healthcare, finance, justice and welfare.[15] For the purposes of this article, only ADMS in the field of workplace relations will be examined,[16] although some insights are derived from studies in related thematic areas. Far from being merely descriptive or

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[12] High-Level Expert Group on Artificial Intelligence, *A Definition of AI: Main Capabilities and Scientific Disciplines* (European Commission, 2019).

[13] Karl Manheim & Lyric Kaplan, *Artificial Intelligence: Risks to Privacy and Democracy*, 21 Yale J.L. Tech. 106–188 (2019); Tambe Prasanna, Peter Cappelli & Valery Yakubovich, *Artificial Intelligence in Human Resources Management: Challenges and a Path Forward*, 61 Cal. Mgmt. Rev. 15–42 (2019).

[14] Ronan Hamon, Henrik Junklewitz & Jose Ignacio Sanchez, *Robustness and Explainability of Artificial Intelligence – From Technical to Policy Solutions* (Publications Office of the European Union 2020).

[15] Katherine C. Kellogg, Melissa A. Valentine & Angèle Christin, *Algorithms at Work: The New Contested Terrain of Control*, 14 Acad. Mgmt. Ann. 366–410 (2020). *See also* Karen Yeung, '*Hypernudge': Big Data as a Mode of Regulation by Design*, 20 Info. Comm. Soc'y 118–136 (2017).

[16] These practices are also referred to as 'people analytics'. Aizhan Tursunbayevaab, Stefano Di Lauro & Claudia Pagliaria, *People Analytics – A Scoping Review of Conceptual Boundaries and Value Propositions*, 43 Int'l J. Info. Mgmt. 224–247 (2018).

observational, these systems entail the possibility of predicting and prescribing conduct, thus pressuring workers to comply with explicit or unwritten rules intended to shape their behaviour. This significantly limits autonomy and free will, the cornerstones of human agency and dignity. As discussed below, labour regulation has principally been developed to provide entitlements that 'compensate'[17] for the diminished level of self-determination in the 'miniature legal systems'[18] governed by employers.

The growth of remote work spurred on by the COVID-19 pandemic has made work-related technologies commonplace, including keystroke tracking, webcam surveillance and desktop monitoring.[19] However, interest in non-human decision-making first arose in the context of platform-mediated work. Couriers and drivers who are dispatched and organized by digital platforms in the food-delivery, transportation and household service sectors arguably served as a test case for data-driven management. Several lawsuits have exposed the detailed operation of the business model of platform companies, which is generally based on the partial delegation of decision-making functions across their full operational cycle to online applications (scheduling, task allocation, remuneration, deactivation) or customers (evaluation).[20] Beyond the boundaries of platform work, both blue- and white-collar workers in 'bricks-and-mortar' services such as logistics, trade and consultancy are currently witnessing the normalization of 'datafication' practices.[21]

A widespread misunderstanding needs to be addressed here. The fallibility of algorithms is often contrasted with the shortcomings of human decision-making processes.[22] This viewpoint risks downplaying the urgent need to deal with the startling 'extravagances' of AI management practices, and it often operates as a paralysing excuse for inaction. Having conceded that human managers are far from perfect, it is essential to acknowledge that contemporary legal systems 'deploy and refine a wealth of experiences in confronting flaws in human decision-making'.[23]

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17 Ruth Dukes, *Constitutionalizing Employment Relations: Sinzheimer, Kahn-Freund, and the Role of Labour Law*, 35 J.L. Soc'y 341–363 (2008).

18 Hugh Collins, *Market Power, Bureaucratic Power and the Contract of Employment*, 15 Indus. L.J. 4 (1986).

19 Kirstie Ball, *Electronic Monitoring and Surveillance in the Workplace. Literature Review and Policy Recommendations* (Publications Office of the European Union 2021).

20 Mirela Ivanova, Joanna Bronowicka, Eva Kocher & Anne Degner, *The App as a Boss? Control and Autonomy in Application-Based Management*, 2 Europa-Universität Viadrina ArbeitGrenze-Fluss (2018); Karen Levy & Solon Barocas, *Refractive Surveillance: Monitoring Customers to Manage Workers*, 12 Int'l J. Comm. 1166–1188 (2018).

21 Sam Adler-Bell & Michelle Miller, *The Datafication of Employment: Report on Surveillance and Privacy*, The Century Foundation (19 Dec. 2018), bit.ly/3wWxuUg (accessed 20 Mar. 2023).

22 John Danaher, *The Threat of Algocracy: Reality, Resistance and Accommodation*, 29 Phil. Tech. 245–268 (2016).

23 Karen Yeung, *Why Worry About Decision-Making by Machine?*, in *Algorithmic Regulation* 21 (Karen Yeung & Martin Lodge eds, Oxford University Press 2019).

As they are accustomed to the idea of accountability, humans are inclined to shape their actions with a view to avoiding negative consequences. Moreover, human flexibility has been 'recognised in socio-legal scholarship as vital in overcoming the inevitable imperfection associated with legal rules'.[24] This is not a straightforward matter for algorithms, given their strict execution-oriented nature and lack of volition.[25]

At the workplace level, errors and disparities caused by human agents may have a limited impact, whereas technocratic artefacts can process myriad cases at a stroke, thereby consolidating oppressive biases to the detriment of large groups of subjects.[26] In addition, the prejudices and flaws of human programmers can easily seep into code, resulting in a new level of non-verifiability. Advocates of the unparalleled reliability of ADMS appear to fall victim to a fallacy, as they compare the putative potential of data-driven tools with the worst failures of ordinary decision-making. This 'double standard' constitutes a bias in favour of an idealistic possibility against existing weaknesses, which people are possibly aware of because they have already been addressed in practice. While intended to increase standardization and reduce the risk of error,[27] algorithms can perpetuate and exacerbate prior patterns of discrimination and generate related harms, including feedback loops.[28] Moreover, the presumed infallibility of data-driven applications deters managers from diverging from decisions taken by such 'apps'.

2.2 Unpacking managerial prerogatives and exploring their limits

The question arises as to whether the shift caused by algorithmic management is a genuine innovation. On closer inspection, large organizations generally rely on hierarchical structures that provide considerable latitude when it comes to governing the workplace. In complex organizations,[29] managerial prerogatives have always been exercised on a discretional basis, resulting in stark power imbalances

[24] *Ibid.*, at 29.

[25] Johanna Jauernig, Matthias Uhl & Gari Walkowitz, *People Prefer Moral Discretion to Algorithms: Algorithm Aversion Beyond Transparency*, 35 Phil. Tech. 1–25 (2022).

[26] Safiya Umoja Noble, *Algorithms of Oppression* (New York University Press 2018). *See also* Bernard E. Harcourt, *Against Prediction: Profiling, Policing and Punishing in the Actuarial Age* (University of Chicago Press 2006).

[27] Ifeoma Ajunwa, *The Paradox of Automation as Anti-bias Intervention*, 41 Cardozo L. Rev. 1671–1742 (2019).

[28] Sebastian Raisch & Sebastian Krakowski, *Artificial Intelligence and Management: The Automation – Augmentation Paradox*, 46 Acad. Mgmt. Rev. 192–210 (2021). *See also* Brishen Rogers, *The Law and Political Economy of Workplace Technological Change* 55 Harv. C.R.-C.L. L. Rev. 531–584 (2020).

[29] Richard C. Edwards, *Contested Terrain: The Transformation of the Workplace in the Twentieth Century* (Basic Books 1982).

between the contractual parties.[30] However, employment regulation seeks to play a dual and ambivalent role. It legitimizes the authority of one party while deploying a wide range of countervailing measures to temper the excesses of that authority in such a way as to avoid arbitrary and irrational behaviour.[31]

In a conventional employment relationship, supervisors are assigned by the employer to govern the workforce by means of orders, appraisals and sanctions. Recently, due to the emergence of innovative arrangements such as those typical of the platform economy, the courts have been asked to determine whether powers exercised through digital instruments amount to top-down authority as defined in EU and domestic law.[32] This appraisal of the evolving nature of 'subordination' has led the courts to acknowledge that traditional hierarchical power can be exercised in different forms using digital tools and platforms.

Data-driven instruments tend to amplify the classical management functions, thereby rendering the corresponding constraints less effective. For example, software is currently used throughout the hiring process, from the drafting of the vacancy notice to the preliminary screening, assessment and remote interviewing phases.[33] Identifying any systemic or human biases that have 'sneaked into' the code can prove arduous in cases in which a vacancy notice may never reach a candidate who has been excluded from the advertisement or because obtaining information about an entire cohort of applicants is rarely feasible. The working hours of employees can be constantly adjusted by means of applications such as Kronos, Onshift and Dayforce, which use data to predict customer preferences, business volumes and weather conditions. Due to this instantaneous and far-reaching picture of such fluctuations, workers' shifts can be modified to minimize their idle time, which curtails their ability to plan ahead with any degree of certainty, in contrast with the provisions of the Directive on transparent and predictable working conditions.[34]

Apps driven by AI and algorithms benefit from delayered bureaucratic hierarchies, with workers being encouraged to indicate their availability, track their performance and rate colleagues, even when work is decoupled from the business premises (as in the case of working from home). Monitoring the fine-grained

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30 Emmanuel Dockès, *Le pouvoir dans les rapports de travail*, in *Droit Social* 620–628 (2004). Philippa Collins & Joe Atkinson, *Labour Rights, Labour Values and Technology at Work*, paper presented at the LLRN5 conference (Jun. 2021).

31 Hugh Collins, *Discretionary Powers in Contracts*, in *Implicit Dimensions of Contract: Discrete, Relational and Network Contracts* 222–223 (David Campbell, Hugh Collins & John Wightman eds, Hart 2003).

32 Guy Davidov, *Subordination vs domination: Exploring the Differences*, 33 Int'l J. Comp. Lab. L. Indus. Rel. 365–389 (2017).

33 Miranda Bogen & Aaron Rieke, *Help Wanted: An Examination of Hiring Algorithms, Equity, and Bias* (2018).

34 Directive (EU) 2019/1152 of the European Parliament and of the Council of 20 Jun. 2019 on transparent and predictable working conditions in the European Union.

aspects of work can determine a shift in the locus, temporal scope and comprehensive nature of surveillance,[35] facilitated by the increasingly blurred boundaries between work and personal life. Thus, information on community habits, personal characteristics and family traits can easily be collected, frequently on a self-reported basis.[36] Moreover, algorithmic management offers potent new ways in which behaviours can be redesigned, enforcing a position of total subservience to the will (and whim) of superiors.

The employment relationship is a two-way organizational arrangement intended to reconcile the conflicting interests of the contracting parties. As a position of domination in a relationship between the parties is not always tolerated in liberal societies,[37] power must be kept within reasonable boundaries. To date, at the EU level, the employers' authority is tempered by the adoption of substantive and procedural rules in a number of legal domains, including labour, anti-discrimination and data protection law.

The key principles range from the need to provide justification for company choices that affect workers, to the importance of taking technical steps to allow for collective scrutiny and verifiability. Process-based law, also referred to as 'proceduralism', may be seen as a shared institution spanning various legal disciplines across the EU.[38] At the national level, consultation and co-determination take place when employers introduce or alter monitoring technology in the workplace.[39] Privacy rules govern the legitimate capturing and processing of data, while working time rules prevent employers from interfering in workers' lives to an unlimited extent. Stringent laws governing due process have to be complied with in the case of dismissals for justified reasons: the worker is required to be notified about the motives and offered an opportunity to appeal against the disciplinary decision by responding to the evidence offered in support of the dismissal.[40] Moreover, employment legislation has been complemented by collectively negotiated rules intended to define employee involvement mechanisms for

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35 Ifeoma Ajunwa, *Kate Crawford and Jason Schultz, Limitless Worker Surveillance*, 105 Cal. L. Rev. 735–776 (2017); Richard A. Bales & Katherine V. W. Stone, *The Invisible Web at Work: Artificial Intelligence and Electronic Surveillance in the Workplace*, 41 Berkeley J. Emp. Lab. L. 1–60 (2020).

36 Catherine Tucker, *Privacy, Algorithms, and Artificial Intelligence*, in *The Economics of Artificial Intelligence: An Agenda* (Ajay Agrawal, Joshua Gans & Avi Goldfarb eds, University of Chicago Press 2018); Dawn Nafus & Gina Neff, *Self-Tracking* (MIT Press 2016).

37 Elizabeth Anderson, *Private Government: How Employers Rule Our Lives (and Why We Don't Talk About It)* (Princeton University Press 2017).

38 Guy Davidov, *Nonwaivability in Labour Law*, 40 Oxford J. Legal Stud. 482–507 (2020).

39 Antonio Aloisi & Elena Gramano, *Artificial Intelligence Is Watching You at Work. Digital Surveillance, Employee Monitoring and Regulatory Issues in the EU Context*, 41 Comp. Lab. L. Pol'y J. 95–121 (2019).

40 Bernd Waas & Guus Heerma van Voss eds, *Restatement of Labour Law in Europe, Vol III Dismissal Protection* (Hart Publishing 2021); Valerio De Stefano, *Master and Servers': Collective Labour Rights and Private Government in the Contemporary World of Work*, 4 Int'l J. Comp. Lab. L. Indus. Rel. 425–444 (2020). *See* Art. 9(2)(a) of the ILO Termination of Employment Convention, 1982 (No. 158).

rebalancing this power asymmetry.[41] This multipronged system is intended to 'cure, eradicate and curtail such imperfections in the labour market' by strengthening the workers' position and curbing the decisional latitude of employers.[42]

In short, algorithmic management threatens to upset the current power balance, as it provides a way to circumvent legal rules limiting the extent of management prerogatives.[43] Code-based systems add a new layer of complexity, since they are more powerful and indecipherable than human managers. Control can be perpetual rather than periodic. It may prove difficult to reconstruct or document procedural steps in an extensive way when power sources are fragmented across multiple actors. Parameters and decisions can evolve over time. Furthermore, the system of penalties fosters a model of preventive compliance, making the issuing of explicit instructions less indispensable. As a result, there is a risk that 'the range of normative values and goals pursued by employment law' will be frustrated.[44]

Commentators have advocated for employment standards to be updated to keep pace with the twenty-first-century workplace and the associated technologies.[45] However, workers are not defenceless, and the next section focuses on the viability of existing remedies.

3 A CONVERGENCE *À LA EUROPÉENNE*: DEVISING AN INTEGRATED STRATEGY

In the EU context, the aim of avoiding the potentially nefarious consequences of ADMS in the workplace can be pursued by jointly reading several legislative provisions that lay down substantive and procedural rules intended to prevent the power of employers from becoming disproportionate or detrimental. When employment relations are 'wired' into a web of data-driven apps, employment rights become inextricably linked to the (individual and collective) exercise of

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41 For instance, the EU directive on business restructuring imposes information and consultation duties on those who carry out business reorganizations. Directive 2009/38/EC on the establishment of a European Works Council or a procedure in Community-scale undertakings and Community-scale groups of undertakings for the purposes of informing and consulting employees (Recast). *See* Guy Mundlak, *Workplace – Democracy: Reclaiming the Effort to Foster Public and Private Isomorphism*, 1 Theory Inquiries L. 159–198 (2014).

42 David Cabrelli & Rebecca Zahn, *Theories of Domination and Labour Law: An Alternative Conception for Intervention?*, 3 Int'l J. Comp. Lab. L. Indus. Rel. 339–364 (2017).

43 Jeremias Adams-Prassl, *What If Your Boss Was an Algorithm? Economic Incentives, Legal Challenges, and the Rise of Artificial Intelligence at Work*, 41 Comp. Lab. L. Pol'y J. 123–146 (2019).

44 Collins & Atkinson, *supra* n. 30.

45 Annette Bernhardt, Lisa Kresge & Reem Suleiman, *Data and Algorithms at Work: The Case for Worker Technology Rights*, UC Berkeley Lab. Ctr. (2021).

personal data protection and anti-discrimination rights.[46] The idea of integrating such schemes to address algorithmic management is not unprecedented. A number of scholars have advocated an 'equal treatment by design' model in this connection,[47] albeit not one tailored to employment matters. To date, these issues have mostly been addressed in isolation. Such ironclad compartmentalization is reflected in the filing and administration of lawsuits, which influences the fragmentation of expertise at the level of legal practice. However, algorithms exhibit a multipurpose nature and require a multidimensional approach. It is essential to avert the risk that 'siloed' regulations and remedies will end up consolidating loopholes in law enforcement.

Strategic litigation has partially revealed the responsibility of employers in terms of concealing internal operations by means of seemingly inexplicable 'black boxes' that penalize certain groups of workers. Arguably, insisting on the importance of revealing the nucleus of an algorithm constitutes a naïve reading of how systems work. In many cases, the code mutates after a decision has been made, and a full reconstruction of the inner working is not a simple task. By contrast, the implied 'uncertainty principle' should prompt workers and claimants to rely on evidentiary instruments that leverage the lack of (shared) information to boost the claimant's attempts to overcome the lack of transparency. This can be achieved by shifting the burden of proof to the employer,[48] establishing presumptions in favour of workers, conducting multi-stakeholder risk assessment and management exercises, or providing the courts or administrative bodies with ample powers of discovery and access to evidence.[49]

A multisource corpus of EU rules can be used to render ADMS accountable, explicable and questionable. Existing tools, as corroborated by the rulings handed down by courts and authorities, can be used cumulatively to enforce the disclosure of the underlying logic behind algorithmic decision-making and promote worker involvement.

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[46] Cansu Safak & James Farrar, *Managed by Bots. Data-Driven Exploitation in the Gig Economy*, Worker Info Exchanges (2021), www.workerinfoexchange.org/wie-report-managed-by-bots (accessed 20 Mar. 2023).

[47] Grozdanovski, *supra* n. 7; Philipp Hacker, *Teaching Fairness to Artificial Intelligence: Existing and Novel Strategies Against Algorithmic Discrimination Under EU Law*, 55 CML Rev. 1143–1185 (2018); Raphaële Xenidis & Linda Senden, *EU Non-discrimination Law in the Era of Artificial Intelligence: Mapping the Challenges of Algorithmic Discrimination,* in *General Principles of EU Law and the EU Digital Order* 151–182 (Ulf Bernitz, Xavier Groussot, Jaan Paju & Sybe A. de Vries eds, Kluwer Law International 2020); Frederik J. Zuiderveen Borgesius, *Strengthening Legal Protection Against Discrimination by Algorithms and Artificial Intelligence*, 24 Int'l J. Hum. Rts. 1572–1593 (2020).

[48] Giovanni Gaudio, *Algorithmic Bosses Can't Lie! How to Foster Transparency and Limit Abuses of the New Algorithmic Managers*, 42 Comp. Lab. L. Pol'y J. 707–741 (2022).

[49] *See* Art. 16(2) of the Proposal for a Directive of the European Parliament and of the Council on improving working conditions in platform work, COM(2021) 762 final [hereinafter Platform Work Directive] ('national courts or competent authorities [shall be] able to order the digital labour platform to disclose any relevant evidence which lies in their control').

3.1 Data protection law promoting legibility and accountability

The debate about the extent of safeguards related to information processed for HRM purposes is still unfolding years after the entry into force of the GDPR in 2018.[50] Promisingly, the Regulation enumerates 'due-process-like protections'[51] for data to be 'useful, intelligible, and actionable to the data subject'.[52] However, inferential analytics – the ability to detect correlations and patterns within datasets and use them to categorize a subject as a group member – is believed to potentially escape the GDPR provisions, which are said to be mainly concerned with the data collection phase, leaving certain aspects of processing unregulated.[53] The opacity of 'black boxes' is generally presented as an obstacle to the legibility of the mathematical formulas leading to final decisions, especially in the case of ML tools. This narrative underestimates or obfuscates the role of the programmers, providers or users who consciously adopt such tools to pursue goals that could be achieved by less intrusive means and who are responsible for introducing key commands in the form of code strings or validating the original datasets.[54]

Algorithms aggregate multiple profiles and base real-time choices on composite metrics. Capricious decision-making is often presented as uncharted territory due to the intricacy of divulging the chain of command (causality deficit) and the 'cloudiness' that prevents laypeople from understanding the underlying logic (impenetrability).[55] Moreover, workplace checks and balances are said to be 'ill equipped' to deal with such issues.[56] An excessive emphasis on transparency, as a

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[50] Computing of categories of data 'revealing racial or ethnic origin, political opinions, religious or philosophical beliefs, or trade union membership' and the processing of 'genetic data, biometric data […], data concerning health or data concerning a natural person's sex life or sexual orientation' are prohibited under Art. 9(1) of the GDPR. However, this general limitation does not apply when such processing 'is necessary for the purposes of carrying out the obligations and exercising specific rights of the controller or of the data subject in the field of employment and social security and social protection law in so far as it is authorised by Union or Member State law or a collective agreement providing for appropriate safeguards'.

[51] Gianclaudio Malgieri & Giovanni Comandé, *Why a Right to Legibility of Automated Decision-Making Exists in the General Data Protection Regulation*, 7 Int'l Data Privacy L. 246 (2017). But *see* Sandra Wachter, Brent Mittelstadt & Luciano Floridi, *Why a Right to Explanation of Automated Decision-Making Does Not Exist in the General Data Protection Regulation*, 7 Int'l Data Privacy L. 76–99 (2017).

[52] Andrew D. Selbst & Julia Powles, *Meaningful Information and the Right to Explanation*, 7 Int'l Data Privacy L. 235 (2017).

[53] Sandra Wachter, Brent Mittelstadt & Chris Russell, *Counterfactual Explanations Without Opening the Black Box: Automated Decisions and the GDPR*, 31 Harv. J.L. & Tech. 841–887 (2018).

[54] Adrián Todolí-Signes, *Algorithms, Artificial Intelligence and Automated Decisions Concerning Workers and the Risks of Discrimination: The Necessary Collective Governance of Data Protection,* 4 Eur. Rev. Lab. & Res. 465–481 (2019).

[55] Andrew D. Selbst & Solon Barocas, *The Intuitive Appeal of Explainable Machines*, 87 Fordham L. Rev. 1092–1094 (2018).

[56] Jeffrey M. Hirsch, *Future Work*, 3 U. Ill L. Rev. 889–958 (2020).

quasi-palliative measure,[57] risks being misplaced,[58] since such a remedy will be of limited practical use if collective mechanisms of redress lag behind. The same is true when a high level of expertise is required to make sense of information, which is not always disclosed in a readable form. Such intricacy impairs the protection of privacy rights for workers, deliberately flooded with barely usable paperwork.

To forestall any algorithmic abuses that jeopardize 'informational self-determination',[59] it is crucial to shift from an adjudicative adversarial approach to a model whereby risks are mitigated before they arise.[60] Access to information can be instrumental in two ways. On the one hand, it focuses on accountability by placing the onus on the employing entity to adopt processes that are not only efficient from an organizational perspective, but also reasonable and reportable. On the other, it grants rights that can be implemented both in terms of changing decisions and laying the groundwork for dealing with grievances relating to the violation of equality laws. These provisions confirm the centrality of process-based law in the workplace, which is supposed to democratize decision-making.

This subsection aims to explore how data protection rights can form the basis for shaping more privacy-compliant policies, reducing the likelihood of algorithmic bias and privacy infringements. To this end, it follows a chronological order, outlining an all-encompassing and step-by-step rulebook to promote the empowerment of workers and their representatives, thus delivering algorithmic accountability.[61]

First, a possibly underestimated resource in this connection is the data protection impact assessment (DPIA) that must be carried out when data processing with new technologies 'is likely to result in a high risk to the rights and freedom of natural persons' (Article 35(1) of the GDPR). Algorithmic discrimination falls neatly within this risk-centred definition. The DPIA should not be a one-off procedure, and it must be carried out prior to the implementation of AI tools and updated in an iterative manner throughout their deployment. Article 35(3)(a) of the GDPR requires a DPIA in the case of 'a systematic and extensive evaluation of personal aspects relating to natural persons which is based on *automated processing,*

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57 Margot E. Kaminski, *The Right to Explanation*, explained, 34 Berkeley Tech. L.J 190–218 (2019). *See also* Mike Ananny & Kate Crawford, *Seeing Without Knowing: Limitations of the Transparency Ideal and Its Application to Algorithmic Accountability*, 3 New Media Soc'y 973–989 (2018).

58 Lilian Edwards & Michael Veale, *Slave to the Algorithm? Why a 'Right to an Explanation' Is Probably Not the Remedy You Are Looking for*, 16 Duke L. & Tech. Rev. 18–84 (2017).

59 Orla Lynskey, *Deconstructing Data Protection: The 'Added-Value' of a Right to Data Protection in the EU Legal Order*, 3 Int'l Comp. L.Q. 569–597 (2014).

60 Isabel Ebert, Isabelle Wildhaber & Jeremias Adams-Prassl, *Big Data in the Workplace: Privacy Due Diligence as a Human Rights-Based Approach to Employee Privacy Protection*, Big Data & Society 1–14 (2021).

61 Compare with Recital 75 of the GDPR. *See also* Alessandro Mantelero, *AI and Big Data: A Blueprint for a Human Rights, Social and Ethical Impact Assessment*, 4 Computer L. Sec. Rev. 754–772 (2018).

including profiling, and on which decisions are based that produce legal effects concerning the natural person or similarly significantly affect the natural person' (emphasis added). Moreover, according to Article 35(7), the assessment must include a systematic description of the operations and purposes of the data processing, the clarification of necessity and proportionality, the risks faced by the data subjects and the measures taken to address those risks and demonstrate compliance with the GDPR.[62]

By encouraging dynamic risk assessment and alleviation, reporting and monitoring, the DPIA is intended to 'shift the focus from *ex post* correction to *ex ante* rules seeking to prevent unfair data processing at the outset',[63] thereby offering collective governance tools and a protective shield for individual rights. Far from being a box-ticking exercise, the DPIA should prompt the redesign of internal practices to ensure full compliance with the law and, at the same time, lay the foundations for the exercise of due process rights. The DPIA 'plays a crucial role in connecting internal company heuristics and risk mitigation to outward-facing rights, and in forming the substance of several different kinds of explanations'.[64] Significantly, the systematic description of ADMS could be disclosed to workers in a plain and accessible form thanks to the DPIA. In addition to contributing to the prevention of unfairness, inaccuracy and discrimination, this 'vigilance' instrument can serve to provide evidence for remedial procedures in favour of allegedly wronged workers.[65]

The DPIA procedure presupposes an ability on the part of the employer to demonstrate that personal data processing is informed by all the principles laid down in Article 5(1) of the GDPR (lawfulness, fairness and transparency, purpose limitation, data minimization, accuracy, storage limitation, integrity and confidentiality) and that the employees have received appropriate information regarding the methods and purposes of the data processing. Such 'data protection via design

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[62] Drafting the document satisfies the controller's duty to implement, review and update 'appropriate technical and organisational measures to ensure and to be able to demonstrate' that the processing is compliant with the Regulation (Art. 24(1) of the GDPR). ADMS, profiling based on 'aspects concerning the data subject's performance at work', systematic monitoring and processing involving vulnerable data subjects all fall within the definition of high risk. *See* Art. 29 WP, Guidelines on Data Protection Impact Assessment (DPIA) (wp248rev.01) (using the example of '[a] company systematically monitoring its employees' activities, including […] employees' work station, internet activity, etc'. as a case in which the DPIA is specifically required). The Art. 29 WP is an ancestor of the European Data Protection Board (EDPB), the EU regulators tasked with enforcing the GDPR.

[63] Hacker, *supra* n. 47.

[64] Margot E. Kaminski & Gianclaudio Malgieri, *Algorithmic Impact Assessments Under the GDPR: Producing Multi-layered Explanations*, 11 Int'l Data Privacy L. 132 (2020).

[65] *See also* Art. 7, Proposal for a Directive of the European Parliament and of the Council on improving working conditions in platform work, COM(2021) 762 final (introducing a *sui generis* algorithmic impact assessment of the risks of automated monitoring and decision-making systems to the safety and health of platform workers).

obligations'[66] are expected to shape a standard of good conduct that 'procedur-alizes' the powers of data controllers, as is the case in many employment-related matters. This information can prove key to bringing a prima facie discrimination case,[67] deterring the employing entity from relying on software provided by third parties without first ensuring an appropriate technical understanding of its implications. This requirement can be turned into a participatory phase by including worker representatives and data protection authorities (Article 36, GDPR).[68] In short, the DPIA reinforces the focus on risk avoidance, while ensuring more collegial data processing in the workplace.

Second, Article 13(2)(f) and 14(2)(g) impose an obligation to notify data subjects that they are involved in 'automated decision-making, including profiling, referred to in Art. 22(1) and (4)'. In addition, 'meaningful information about the logic involved, as well as the significance and the envisaged consequences of such processing for the data subject', must be provided when personal data are collected from the data subject or from a third party, respectively. As explained in Recital 60, the goal is 'to ensure fair and transparent processing taking into account the specific circumstances and context'. Article 15(1) adopts the same wording to flesh out the individual right to access, whereby the data controller is required to share meaningful information about the logic, significance and consequences of the data processing. Subsection (h) of the same article explicitly mentions the need to obtain information regarding 'the existence of automated decision-making, including profiling, referred to in Article 22(1) and (4) and, at least in those cases, meaningful information about the logic involved, as well as the significance and the envisaged consequences of such processing for the data subject'. These provisions offer a reliable means for examining the lawfulness of processing or seeking legal remedies.

Admittedly, notification and access rights risk being confined to statutes on the books when information is unevenly distributed. Still, a carefully drafted DPIA can address such limitations by allowing workers to learn more about the 'logic' or rationale behind the formula based on certain features and weights, and the effects

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[66] Pieter Van Cleynenbreugel, *EU By-design Regulation in the Algorithmic Society*, in *Constitutional Challenges in the Algorithmic Society* 204 (Hans-W. Micklitz, Oreste Pollicino, Amnon Reichman, Andrea Simoncini, Giovanni Sartor & Giovanni De Gregorio eds, Cambridge University Press 2021).

[67] Elise Muir, *EU Equality Law: The First Fundamental Rights Policy of the EU* 161 (Oxford University Press 2018).

[68] 'The controller must "seek the views of data subjects or their representatives" (Art. 35(9)) where appropriate'. The WP29 considers that 'those views could be sought through a variety of means, depending on the context (e.g., a generic study related to the purpose and means of the processing operation, a question to the staff representatives, or usual surveys sent to the data controller's future customers) […]; if the data controller's final decision differs from the views of the data subjects, its reasons for going ahead or not should be documented'. Art. 29 WP, Opinion 2/2017 on data processing at work.

of the data processing. The safeguards grow in proportion to the extent of the risks and the expertise of those making the requests. According to Article 29 Working Party (Article 29 WP),[69] although not indispensable, 'a complex mathematical explanation about how algorithms or machine-learning work' should be provided if it is necessary to allow experts to identify the workings of the decision-making process.[70]

Third, all these provisions must be read in conjunction with Article 22, which is considered one of the most promising provisions of the GDPR.[71] Regrettably, a measure that has been interpreted – perhaps overly optimistically – as an outright ban on ADMS does not apply when this type of processing is presented as 'necessary for entering into, or performance of, a contract between the data subject and a data controller', which could be the case in relation to employment-related applications of automated decisions, and when it is based on the explicit consent of the data subject. Article 29 WP specifies that consent cannot serve as a legal basis in the context of employment, given the inherent imbalance of power in the position of the workers who risk suffering the consequences of refusing to give consent. However, the first 'necessity' exception is likely to limit the application of the provision at workplace level. Section 3 comes to the rescue here, providing that 'the data controller shall implement suitable measures to safeguard the data subject's rights and freedoms and legitimate interests, at least the right to obtain human intervention on the part of the controller, to express his or her point of view and to contest the decision'. This list of due process safeguards, implementing the fundamental principle of providing an opportunity to be heard for the addressee of any decision, is not exhaustive.[72]

In spring 2021, when dealing with cases of drivers working for a platform allegedly 'robofired' by an algorithm, an Amsterdam court ruled that the workers had been denied access to meaningful information concerning the individual ratings providing input into the algorithms (Article 15, GDPR).[73] In two instances, however, the suspension of the account and a 'matchmaking' feature were not

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69 Article 29 WP, Guidelines on automated individual decision-making and profiling 2016/679 (wp251rev.01).

70 Michael Veale & Lilian Edwards, *Clarity, Surprises, and Further Questions in the Article 29 WP Draft Guidance on Automated Decision-Making and Profiling*, 34 Computer L. Sec. Rev. 398–404 (2018).

71 Lee A. Bygrave, *Minding the Machine v2.0. The EU General Data Protection Regulation and Automated Decision-Making*, in *Algorithmic Regulation* (Karen Yeung & Martin Lodge eds, Oxford University Press 2019).

72 Selbst & Powles, *supra* n. 52.

73 The cases starkly reveal the huge potential of the GDPR as well as the ambiguity of some relatively new formulations, such as 'solely automated processing' or 'effects that are legally similar to legal ones'. Sebastião Barros Vale & Gabriela Zanfir-Fortuna, *Automated Decision-Making Under the GDPR: Practical Cases from Courts and Data Protection Authorities, Future of Privacy Forum* (2022), https://bit.ly/3FUGXRg (accessed 20 Mar. 2023).

considered to have 'significantly' affected those workers under Article 22 of the GDPR, which partially contrasts with the opinion of Article 29 WP.[74] In a similar case, one applicant succeeded in establishing the adoption of an automated system for calculating wage deductions and in enforcing the right to know the overall assessment and specific weighting criteria used in the model. Two major ride-hailing companies, Uber and Ola, were ordered to reveal information about the choices made, the data analysed and the assumptions justifying the final decision, allowing platform workers to verify the accuracy and lawfulness of the data processing. While not major victories, and despite the failed attempt by Uber to claim that data access requests coordinated by a union constituted an abuse of rights, such union-led litigation offered a glimpse into the strengths and limitations of the GDPR when mobilized against the improper use of algorithms.

Opinions about the existence of a right to explanation in the GDPR are polarized.[75] Much has been written about the imperfect match between Article 22 and Recital 71, which outlines a model providing 'suitable safeguards, which should include specific information to the data subject and the right to obtain human intervention, to express his or her point of view, to *obtain an explanation of the decision reached after such assessment* and to challenge the decision' [emphasis added]. For the sake of brevity, this subsection does not engage with the stimulating discussion concerning the reading of some sections of the GDPR, and instead supports a purposive interpretation of the Recital. While it is well known that recitals are not legally binding, they can 'cast light on the interpretation to be given to a legal rule'.[76] More importantly, Article 29 WP states that the data controller is required to find simple ways to inform the data subject about the rationale or the criteria behind a decision.[77] The Guidelines pragmatically confirm that it is not necessary to disclose the full algorithm, that is often protected by trade secrecy, or to offer in-depth technical explanations. What is necessary is the sharing of meaningful information about the underlying logic (including the factors and their respective weightings) so as to enable the worker to understand and possibly challenge the decisions.[78]

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74 Article 29 WP, Guidelines on Automated individual decision-making and Profiling for the purposes of Regulation 2016/679, at 22.

75 For an overview, *see* Bryan Casey, Ashkan Farhangi & Roland Vogl, *Rethinking Explainable Machines: The GDPR's 'Right to Explanation' Debate and the Rise of Algorithmic Audits in Enterprise*, 34 Berkeley Tech. L.J. 143–188 (2019); Bryce Goodman & Seth Flaxman, *European Union Regulations on Algorithmic Decision-Making and 'a Right to Explanation'*, 38 AI MAG 55–56 (2017).

76 Case 215/88 *Casa Fleischhandels-GmbH v. Bundesanstalt für landwirtschaftliche Marktordnung* 13 Jul. 1989 ECLI:EU:C:1989:331. *See* Tadas Klimas & Jurate Vaiciukaite, *The Law of Recitals in European Community Legislation*, 15 ILSA J. Int'l & Comp. L. 61–93 (2008).

77 Guidelines on Automated individual decision-making and Profiling for the purposes of Regulation 2016/679, at 25.

78 Emre Bayamlıoğlu, *The Right to Contest Automated Decisions Under the General Data Protection Regulation: Beyond the So-called 'Right to Explanation'*, 16 Regul Gov 1058–1078 (2021). For a critical perspective,

In addition to encouraging preventive and protective measures relating to ADMS, the proposed Directive on platform work provides the right to obtain an explanation for any decision made or merely supported (as opposed to fully carried out) by ADMS 'that significantly affect the platform worker's working conditions' (Article 8).[79] Moreover, by adopting an instrumentalist approach, the AI Act[80] – currently under discussion for approval – states that high-risk systems within the workplace must be 'sufficiently transparent to enable users to interpret the system's output and use it appropriately' (Article 13). The proposed Regulation focuses on the use of AI systems 'for recruitment or selection of persons' and for 'making decisions on promotion and termination and for task allocation, monitoring or evaluation of persons in work-related contractual relationships' (Recital 36). While acknowledging that these 'high-risk' AI practices pose significant risks to health and safety or other fundamental rights, it merely requires such systems to comply with certain essential requirements through *ex-ante* conformity assessment procedures. While it is too early to say if the final version will address the concerns raised by a number of scholars,[81] it should be noted that the AI Act may have deregulatory effects on the current sectoral and national legislation, which sets a high standard of protection.[82] Should the two legal instruments be approved in their current form, EU law would end up affording new protection to those performing platform work while diminishing (domestic) protective standards against the same types of management for all other workers.[83]

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see Sandra Wachter, Brent Mittelstadt & Chris Russell, *Why Fairness Cannot be Automated: Bridging the Gap Between EU Non-discrimination Law and AI,* 41 Computer L. Sec. Rev. 1–30 (2021).

79 This provision must be read in conjunction with Art. 14, which mandates 'human oversight' to prevent or minimize 'the risks to health, safety or fundamental rights that may emerge when a high-risk AI system is used in accordance with its intended purpose or under conditions of reasonably foreseeable misuse'. *See also* Regulation (EU) 2019/1150 of the European Parliament and of the Council of 20 Jun. 2019 on promoting fairness and transparency for business users of online intermediation services (on transparency regarding ranking and complaint-handling mechanisms).

80 Proposal for a Regulation of the European Parliament and of the Council Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act) COM/2021/206 Final.

81 Aislinn Kelly-Lyth, *European Union, the AI Act and Algorithmic Management*, Comp. Lab. L. Pol'y J., Dispatch (2021).

82 Michael Veale & Frederik Zuiderveen Borgesius, *Demystifying the Draft EU Artificial Intelligence Act – Analysing the Good, the Bad, and the Unclear Elements of the Proposed Approach*, 22 Comp. L. Rev. Int'l 97–112 (2021). More worryingly, as it is based on market liberalization goals, the AI Act may deem such heterogeneous models incompatible with internal market functioning. Its legal basis (Art. 114 of the Treaty on the Functioning of the European Union [TFEU]) could be used to trump existing national regulations. *See* Miriam Kullmann & Aude Cefaliello, *The Draft Artificial Intelligence Act (AI Act): Offering False Security to Undermine Fundamental Workers' Rights,* 13 Eur. Lab. L.J. 542–562 (2022).

83 Valerio De Stefano & Mathias Wouters, *AI and Digital Tools in Workplace Management Evaluation: An Assessment of the EU's Legal Framework* (Brussels: Scientific Foresight Unit, European Parliamentary Research Services 2022).

In short, the GDPR provisions afford meaningful protection against the increasing power of the employer because they regulate the process by which data can be collected, limit the subtlest forms of automated decision-making, and render business practices open and objectionable.[84] Rules concerning information, disclosure and explanation of the logic underlying algorithms are especially noteworthy if read as a procedural *prius* for shaping bias-free workplace policies and eradicating discrimination. As a global benchmark, the GDPR is finally revealing its forward-looking nature. In this respect, the 'interventionist' role of data protection authorities is crucial, as they have the resources and skills necessary to enforce compliance with data protection regulations.[85] They have been increasingly cooperating across EU countries to enforce information, access and explanation rights.

3.2 Equality law addressing data-driven discrimination

By operating at the level of impacts, non-discrimination law promises to capture new forms of bias hardwired into algorithms and to provide useful remedies for their disparate impacts.[86] This allows workers to bypass the need to identify the inner workings of the algorithm: presenting the facts that imply a lack of compliance with equal treatment rules has occurred or is likely to occur would be sufficient to provide the basis for evidentiary simplifications that benefit the injured party. Hence, legal inferences can be used in court to defeat inferential analytics. Such rules may also operate as adequate and dissuasive sanctions, forcing companies to modify their policies. For example, in 2020, an Italian court found a scheduling algorithm to have discriminatory impacts on food-delivery riders by treating them all the same, regardless of the reasons for their absence, thus disadvantaging those who were on strike or sick, had a disability, or assisted a disabled person or a sick minor. The standardized application of a sanctioning model had a disparate impact on workers who were exercising constitutionally sanctioned rights. These workers were marginalized when it came to accessing better-paid jobs, 'significantly reducing [their] future work opportunities'.[87] Before the ruling had been handed down, the platform changed the algorithm.

Some constitutive elements of algorithms, however, threaten the full application of the existing framework. The level of granularity achieved by means of ML

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[84] Giovanni Sartor & Francesca Lagioia, *The Impact of the General Data Protection Regulation (GDPR) on Artificial Intelligence*, Directorate-General for Parliamentary Research Services of the Secretariat of the European Parliament. Brussels: European Union (2020).

[85] András Jóri, *Shaping vs Applying Data Protection Law: Two Core Functions of Data Protection Authorities*, 5 Int'l Data Privacy L. 133–143 (2015).

[86] Evelyn Ellis & Philippa Watson, *EU Anti-discrimination Law* (Oxford University Press 2012).

[87] Tribunal of Bologna, Order no. 2949/2019, 31 Dec. 2020, 19. *See* Vincenzo Pietrogiovanni, *Deliveroo and Riders' Strikes: Discriminations in the Age of Algorithms*, 7 Int'l Lab. Rts. Case L. 317–321 (2021).

can provide managers with an opportunity to differentiate treatments in a tailor-made manner, attributing competitive entitlements such as shifts, instructions, promotions, pay rises, disciplinary measures and even terminations on the basis of information not normally available to workers in traditional workplaces. In short, counterintuitive, subtle and intangible classifications can open up new avenues for 'invisible' forms of discrimination.[88]

Moreover, metrics are designed to be able to evolve, and programs can be written to juggle an infinite number of factors. This is arguably one of the most controversial issues concerning big data analytics: categories are constructed based on characteristics that are not plainly considered protected grounds or easily associated with such grounds (such as facial expressions, tone of voice, use of specific words, sentence length and talking speed during recruitment procedures). In addition, consider the possibility of penalizing job applicants after inferring from an outdated browser that they are connecting from a public library in a particular neighbourhood, a factor associated with a certain educational background.[89] While patterns and correlations may be as effective as direct identifiers, these grounds (IP address, location, education) are not included in EU equality law.[90] Furthermore, workers may also be disadvantaged after being mischaracterized as belonging to a particular group, making judicial redress even more complicated for those affected.

Reviewing the rights set out in the EU's non-discrimination directives goes beyond the scope of this paper, but it is intriguing that the overall model covers the entire cycle of managerial functions.[91] In addition, mention should be made of

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88 Raphaële Xenidis, *Tuning EU Equality Law to Algorithmic Discrimination: Three Pathways to Resilience*, 27 Maast. J. Eur. & Comp. L. 736–758 (2020).

89 Aislinn Kelly-Lyth, *Challenging Biased Hiring Algorithms*, 41 Oxford J. Legal Stud. 899–928 (2020).

90 As in the 'infamous' example of the Amazon hiring algorithm that taught itself to discriminate against female candidates, ML applications can elaborate multiple variables or detect patterns in large datasets, thereby 'elevating' a discernible protected trait in decision-making. *See* Miriam Kullmann, *Platform Work, Algorithmic Decision-Making, and EU Gender Equality Law*, 34 Int'l J. Comp. Lab. L. Indus. Rel. 1–21 (2018).

91 Directive 2000/78/EC tackles discrimination on the grounds of religion, belief, disability, age or sexual orientation in relation to employment matters. Directive 2000/43/EC implements the principle of equal treatment irrespective of racial or ethnic origin in employment matters and beyond. Directive 2004/113/EC concerns equal treatment between men and women in terms of access to and supply of goods and services and, therefore, deals with gender equality in the consumption market, whereas Directive 2006/54/EC addresses gender discrimination in matters of employment and occupation, as complemented by Directive 2010/41/EU regarding equal treatment between men and women engaged in an activity in a self-employed capacity. Mark Bell, *Anti-discrimination Law and the EU* (Oxford University Press 2002). Strikingly, gender equality and sex discrimination are not mentioned in Recital 71 of the GDPR ('racial or ethnic origin, political opinion, religion or beliefs, trade union membership, genetic or health status or sexual orientation'), which misaligns the two groups of protected factors. Similarly, the broad notion of sensitive data set out in Art. 9(1) of the GDPR ('racial or ethnic origin, political opinions, religious or philosophical beliefs, or trade union membership, […] genetic data, biometric data, data concerning health or data concerning a natural person's sex life or sexual orientation') does not overlap with the list included in Art. 19 TFEU, failing to explicitly mention sex, disability and age. *See also* Art. 22(4) of the GDPR, according to which

Article 21 of the Charter of Fundamental Rights of the EU, which prohibits discrimination based on any ground such as sex, race, colour, ethnic or social origin, genetic features, language, religion or belief, political or other opinion, membership of a national minority, property, birth, disability, age or sexual orientation.[92] Given the use of the qualifier 'such as', this could be construed as an open and non-exhaustive list of protected factors. Such a reading would widen the range of grounds on which to base the fight against algorithmic discrimination.[93]

For the purposes of clarification, 'direct discrimination' occurs when 'one person is treated *less favourably* than another is, has been, or would be treated in a comparable situation on any of the protected grounds'.[94] On the other hand, 'indirect discrimination' is defined as:

> an apparently neutral provision, criterion or practice [that] would put [persons with a membership of a protected category] *at a particular disadvantage* compared with other persons, unless that provision, criterion or practice is justified by a legitimate aim and the means of achieving that aim are appropriate and necessary (emphasis added).[95]

From a litigation perspective, to successfully demonstrate discrimination, the claimant is required to prove a twofold nexus of causality between the conduct and the harm suffered, as well as between the action and the protected ground. Direct discrimination cannot be justified, putting the defendant in an inconvenient position. However, claimants could be required to 'isolate' a single protected ground (or a proxy thereof) to make their case, a complex issue aggravated by the need to identify a comparator that meets the relevant definition, which 'has proved to be the Achilles heel of EU equality law'.[96] While it would be odd for programmers to 'codify' less favourable treatment based on the possession of a protected characteristic, software typically undergoes a validation stage that allows analysts to assess the operation of the model in practice, predict the likelihood of errors and determine their relevance

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decisions based solely on automated processing, including profiling, should not be based on special categories of personal data.

92 *See also* Arts 2 and 3 of the TEU; Arts 8, 10, 19 153 and 157 of the TFEU. *See also* Arts 21 and 23 of the EU Charter of Fundamental Rights.

93 However, the Court of Justice of the EU (CJEU) seems reluctant to depart from a closed catalogue and so is likely to stick to the factors mentioned in secondary law. C-354/13 *Fag og Arbejde (FOA) v. Kommunernes Landsforening (KL)* 18 Dec. 2014 EU:C:2014:2463; C-13/05 *Sonia Chacon Navas v. Eurest Colectividades* SA 11 Jul. 2006 EU:C:2006:456.

94 Article 2(1)(a) Recast Gender Equality Directive. *See also* Art. 2(2)(a) of Directive 2000/43/EC, Art. 2(2)(a) of Directive 2000/78 and Art. 3(a) of Directive 2010/41.

95 Article 2(1)(b) of Directive 2006/54, Art. 2(2)(b) of Directive 200/43, Art. 2(2)(b) of Directive 2000/78 and Art. 3(b) of Directive 2010/41.

96 Nicola Countouris, *EU Law and the Regulation of 'Atypical' Work*, in *Research Handbook on EU Labour Law* 246 (Alan Bogg, Cathryn Costello & A. C. L. Davies eds, Edward Elgar 2016).

to the performance of the model.[97] Thus, when a variable emerges as giving rise to discriminatory effects despite the source code being 'blind' to protected grounds, it does not limit the application of non-discrimination rules.[98]

Indirect discrimination is highly suited to challenging algorithmic bias, as it is inherently concerned with the disadvantaging impact of a de facto 'standardized' decision, measure or policy, rather than with the mere membership of a community identified by the presence of a shared protected ground. Those who claim that algorithms reduce arbitrary behaviour rely on the argument that they 'answer to no one', which is precisely the rationale behind indirect discrimination. In many cases, treating similar situations differently represents a way to pursue substantive equality. On the other hand, 'sartorial neutrality' may disproportionately affect members of vulnerable groups.[99] In addition, as algorithms are highly effective at discriminating on the basis of socio-economic status, educational background, health status and income, relying on the notion of indirect discrimination by proxy can offer efficient solutions.[100] Still, on the negative side, a broader set of justifications apply to this form of discrimination. Stark tensions could arise between predictive accuracy as a legitimate business requirement and social justice paradigms. However, this does not mean that the courts cannot be persuaded that there was a less discriminatory practice that was deliberately not adopted by the employer.

Both forms of discrimination present advantages and disadvantages when considering disparate treatment as the result of an algorithm.[101] A common opportunity lies in the fact that the notion of intent is irrelevant to both types, while a shared shortcoming is associated with difficulties in 'identifying differential treatment on the basis of protected grounds, especially when they are abstracted, or intersectional, or emergent'.[102] Workers are seldom in a position to realize that they have been placed in a 'risky' group at the systemic level because data-driven matching processes are fed with innumerable variables.[103] This is aggravated by a traditionally narrow interpretation of protected grounds. Discrimination by

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97 Betsy Anne Williams, Catherine F. Brooks & Yotam Shmargad, *How Algorithms Discriminate Based on Data they Lack: Challenges, Solutions, and Policy Implications*, 8 J. Info. Pol'y 78–115 (2018).

98 Marzia Barbera, *Discriminazioni algoritmiche e forme di discriminazione*, 7 Lab. L. Issues 1–17 (2021). *See also* Jeremias Adams-Prassl, Reuben Binns & Aislinn Kelly-Lyth, *Directly Discriminatory Algorithms*, 1 Mod. Law Rev. 144–175 (2022).

99 Marc De Vos, *The European Court of Justice and the March Towards Substantive Equality in European Union Anti-discrimination Law*, 20 Int'l J. Discrim. L. 62–87 (2020).

100 Case C-457/17 *Heiko Jonny Maniero v. Studienstiftung des deutschen Volkes eV* 15 Nov. 2018 EU: C:2018:912. *See also* Anya E.R. Prince & Daniel Schwarcz, *Proxy Discrimination in the Age of Artificial Intelligence and Big Data*, 105 Iowa L. Rev. 1263–1318 (2020).

101 Xenidis & Senden, *supra* n. 47.

102 Monique Mann & Tobias Matzner, *Challenging Algorithmic Profiling: The Limits of Data Protection and Anti-discrimination in Responding to Emergent Discrimination*, 6 Big Data & Soc'y 1–11 (2019).

103 Matthias Leese, *The New Profiling: Algorithms, Black Boxes, and the Failure of Anti-discriminatory Safeguards in the European Union*, 45 Sec. Dialogue 494–511 (2014).

perception, ascription or assumption does not find neat and explicit protection in EU law, despite being the most common way ML works.[104]

Equality law has afforded new methods of overcoming this flaw in an evolutionary way, with case law playing an innovative role. A number of rulings have extended the notion of direct discrimination to cases in which a person is treated unfavourably because they are associated with a protected characteristic that they do not possess themselves (in *Coleman*, discrimination by association was recognized in favour of a mother based on her child's disability).[105] Moreover, the concept has been extended to include cases in which 'decisions are made on the basis of characteristics related to, but different from, protected grounds', such as the *CHEZ* ruling using residency as a proxy for ethnicity in a rather expansive manner. More specifically, in a claim brought by a non-member of the Roma community, residents of an urban district with many Roma residents were found to have been discriminated against as a result of technical factors due to their electric meters being located at an unusual height.[106] *Coleman* and *CHEZ* demonstrate that, far from being static, EU non-discrimination law can apply beyond the range of those individuals with particular protected characteristics.

The Court of Justice of the EU (CJEU) is inclined to interpret the idea of a protected characteristic flexibly and purposively, in such a way as to cover individuals who do not necessarily belong to the group of persons sharing the characteristic in an immutable fashion. By leveraging this evolutionary and judge-made notion, (direct) discrimination by association and proxy can address algorithms programmed or trained to use behavioural data that present functional affinity with protected grounds for classification and decision-making purposes.

According to the same reasoning, when the validation phase fails to include anticipatory safeguards capable of preventing disparities arising from protected factors (even by means of neutral policies), non-discrimination law should apply. In fact, conscious 'blindness' to a protected characteristic does not insulate the employer when deliberate preferences can result in discrimination against a certain group, as demonstrated by the Italian case discussed above. This is also true for the vast bulk of data processing systems for hiring and promotion that process

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[104] Janneke Gerards & Raphaële Xenidis, *Algorithmic Discrimination in Europe: Challenges and Opportunities for Gender Equality and Non-discrimination Law* (Publications Office of the European Union 2021).

[105] Case C-303/06 *S. Coleman v. Attridge Law and Steve Law* 17 Jul. 2008 ECLI:EU:C:2008:415.

[106] Case C-83/14 *'CHEZ Razpredelenie Bulgaria' AD v. Komisia za zashtita ot diskriminatsia* 16 Jul. 2015 ECLI:EU:C:2015:480. A prominent example is discriminatory treatment based on pregnancy, which is classified as sex discrimination because pregnancy is considered a proxy for 'being a woman'. C-177/88 *Elisabeth Johanna Pacifica Dekker v. Stichting Vormingscentrum voor Jong Volwassenen (VJV-Centrum) Plus* 8 Nov. 1990 EU:C:1990:383. *See* Marc De Vos, *Substantive Formal Equality in EU Non-discrimination Law*, in *The European Union as Protector and Promoter of Equality* 250 (Thomas Giegerich ed., Springer 2020).

information, such as average working hours, educational background, career consistency and retention prospects, that can to some extent be associated with protected grounds. This approach will be crucial, especially when it comes to countering indicators used to 'screen out a disfavoured group'.[107] Predictive accuracy should not be used as a justification in such cases, as it would have difficulty passing the tests of legitimacy, necessity and appropriateness. In fact, given the obligation to assess the dataset in order to minimize risks, the inclusion of factors indirectly associated with protected grounds works against management interests and could be successfully used in court.

A further aspect that deserves attention concerns the lack of accessibility to data that has long plagued the application of equality law provisions in employment. In this respect, the algorithmic 'parallel universe' does not differ significantly from the analogue world. Proving discrimination has always been a difficult task. However, several limitations of the current understanding and application could be overcome by mastering data protection rights. In this circular process, access to information granted by the GDPR can be used to establish a prima facie case of discrimination, which would contribute to removing the current 'stumbling blocks',[108] paving the way for strategic litigation to benefit those most vulnerable to ADMS. Data protection authorities could offset the enforcement deficit by facilitating access to documents and materials that are not publicly available.

The post-2000 directives in the field of anti-discrimination include special evidentiary rules whereby the burden of proof is partially reversed or shared between the claimant and the respondent (in this context, the employer).[109] This shift in the burden of proof represents an exception to the general principle by which 'each party bears the burden of proving the facts it alleges and from which it derives favourable legal consequences'.[110] Those persons who consider themselves 'wronged because the principle of equal treatment has not been applied to them'[111] need only establish in court plausible yet not conclusive facts from which it can be presumed that direct or indirect discrimination has occurred. Notably, this requirement can be fulfilled by showing that the employer did not comply with the duty of care, or engaged in negligent conduct. It is incumbent on the alleged perpetrator

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[107] Pauline Kim & Matthew T. Bodie, *Artificial Intelligence and the Challenges of Workplace Discrimination and Privacy*, ABA J. Lab. & Emp. L. 289–315 (2021).

[108] Philippa Collins, *Automated Dismissal Decisions, Data Protection and the Law of Unfair Dismissal*, UK Labour Law Blog (19 Oct. 2021), bit.ly/3oaNfnu (accessed 20 Mar. 2023).

[109] Julie Ringelheim, *The Burden of Proof in Antidiscrimination Proceedings. A Focus on Belgium, France and Ireland*, 2 Eur. Equal L. Rev. 49–64 (2019).

[110] Lilla Farkas & Orlagh O'Farrell, *Reversing the Burden of Proof: Practical Dilemmas at the European and National Level* (Publications Office of the European Union 2015).

[111] In the Racial Equality and Employment Equality Directives adopted in 2000, as well as in the 2004 Gender Equality in Access to Goods and Services Directive and the 2006 Recast Gender Directive.

to demonstrate that the principle of equal treatment was not breached by disproving the dual causal link between the harm, the conduct and the protected characteristic, or by presenting a valid justification that passes the relevant tests of appropriateness and necessity, in the case of a claim for indirect discrimination.

A successful strategy can be devised by establishing a prima facie case of discrimination that points to an algorithm as the source of bias and then rebutting claims that the differential treatment cannot be exclusively and compellingly justified by the presence of a protected characteristic.[112] This can also be achieved using statistical or testimonial (circumstantial) evidence. For instance, the numerical over-representation of women among those taking parental leave can be used to justify a presumption of discrimination when less favourable treatment is adopted in relation to workers requesting parental leave.[113]

Reversing the burden of proof only partially mitigates the obstacles faced by claimants. Despite this innovative model, gathering evidence can prove arduous for those making a claim for discrimination and, in some cases, monitoring entities due to the lack of transparency. However, since providing prima facie evidence of discrimination could be sufficient, there is no need to open up the 'black box' to prove algorithmic discrimination in court. Workers can exercise their right to access information not included in the DPIA to make a solid case. Scholars warn that data controllers may be uncooperative and take advantage of inherent information asymmetries, in an awareness that the courts are not prone to forcing them to divulge corporate information or confidential data. However, such a form of resistance is not bulletproof. In *Meister* – a case dealing with the rejection during the recruitment process of a candidate who met the criteria for the post – the CJEU confirmed that there is no specific requirement to share data with the applicant making a claim for discrimination. A promising sign is that the CJEU added that 'refusal to grant any access to information [to the applicant meeting the requirements of the job advertisement] may be one of the factors to take into account in the context of establishing facts from which it may be presumed that there has been direct or indirect discrimination'.[114] Consequently, hesitancy or

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[112] *See* Sandra Fredman, *Pasts and futures: EU Equality Law*, in *Research Handbook of European Labour Law* 391–421 (Alan Bogg, Cathryn Costello & A. C. L. Davies eds, Edward Elgar 2016).

[113] Xenidis & Senden, *supra* n. 47 (indicating 'average working hours' as a potentially discriminatory proxy used against female applicants in case of promotion also when past successful candidates' data has been made blind to applicants' gender). *See also* C-170/84 *Bilka-Kaufhaus GmbH v. Weber von Hartz* 13 May 1986 ECLI:EU:C:1986:204.

[114] Case C-415/10 *Galina Meister v. Speech Design Carrier Systems GmbH* 19 Apr. 2012 ECLI:EU:C:2012:217, para. 47. The employer's refusal to disclose information can 'make his decisions virtually unchallengeable. […] In the context of a recruitment procedure, […] the position of the applicant – inevitably external to the undertaking in question – makes obtaining evidence or facts from which it may be presumed that there has been discrimination even more difficult than if the applicant sought to prove that the employer applies discriminatory measures in respect of conditions of

reluctance to fulfil the duty under Article 15 of the GDPR or, more broadly, a restrictive position may be used in court as circumstantial evidence supporting a prima facie case of discrimination.[115]

The employer may not have an obligation to reveal the factors applied by an algorithm, as it is sufficient to show that a certain practice serves a legitimate aim and is proportionate. However, the GDPR is complemented by the Guidelines, which recommend that companies assess datasets for bias, regularly review the accuracy and relevance of decisions, adopt systems that audit algorithms and use 'appropriate procedures and measures to prevent errors, inaccuracies or discrimination' based on sensitive data.[116] Moreover, the DPIA should ensure algorithmic legibility and accountability by allocating a set of duties to the data controller, who is required to explain 'the measures envisaged to address the risks, including safeguards, security measures and mechanisms to ensure the protection of personal data'. Considering the proposed integrated strategy, this disclosure can provide valid arguments that substantiate a prima facie claim or, at least, prompt *ex ante* compliance. The DPIA is meant to be accessible by default and could also be used to rebut evidence produced by the respondent in an effort to discharge the burden of proof.

Despite the significant merits of building compliance, Article 35 of the GDPR could also offer a shield to employers in claims relating to indirect discrimination.[117] In particular, the putative offender could acknowledge the risk of neutral practices resulting in disparate impacts and lay the groundwork for proving in court that there is an objective justification and proportionate means of achieving a legitimate aim, as supported by a demonstration of technical performance for refuting the presumption of discrimination. However, the mere reliance on assertions of bias prevention mechanisms cannot insulate employers from the risk of losing in court.[118] It is important that exceptions are formulated

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employees' pay, for example', para. 32, Opinion of Advocate General Mengozzi delivered on 12 Jan. 2012 Case C-415/10.

115 *See also* Case 109/88 *Handels-og Kontorfunktionærernes Forbund I Danmark v. Dansk Arbejdsgiverforening, Acting on Behalf of Danfoss* 17 Oct. 1989 ECLI:EU:C:1989:383 ('where an undertaking applies a system of pay which is totally lacking in transparency, it is for the employer to prove that his practice in the matter of wages is not discriminatory, if a female worker establishes, in relation to a relatively large number of employees, that the average pay for women is less than that for men', para. 16). In Case C-104/10 *Patrick Kelly v. National University of Ireland (University College Dublin)* 21 Jul. 2011 ECLI:EU:C:2011:506, the CJEU held that 'a refusal of disclosure by the defendant, in the context of establishing such facts, could risk compromising the achievement of the objective pursued by [the burden of proof] directive and thus depriving, in particular, Art. 4(1) thereof of its effectiveness', para. 39.

116 Guidelines on Automated individual decision-making and Profiling for the purposes of Regulation 2016/679, at 28.

117 Anna Beale, *Proving Discrimination: The Shift of the Burden of Proof and Access to Evidence,* Academy of European Law (2018).

118 In relation to the assessment of employers' justifications, *see* Case C-188/15 *Asma Bougnaoui and Association de défense des droits de l'homme (ADDH) v. Micropole SA* 14 Mar. 2017 ECLI:EU:C:2017:204

narrowly, and that the necessity, adequacy and proportionality of criteria and practice are well examined.

3.3 Enabling collective rights to temper algorithmic power

Due to the intrinsic attributes of the labour market, such as imperfect information and near-monopsony, workers have traditionally joined forces to form a vigorous countervailing force. Worker involvement is a realistic strategy that has the advantage of avoiding the self- or de-regulatory tendencies that could arise from approaches focused on ethical codes or auditing, which are gaining prominence in the academic and policy debate despite lacking any meaningful binding force.[119] Drawing on a variety of methods, collective labour law can lead the way, offering wide-ranging normative solutions to be implemented beyond its boundaries.[120] Without minimizing the loss of force of institutional paradigms of workplace voice and industrial relations, let alone the difficulties of exercising collective rights in fragmented labour markets, a renewed cooperative perspective should prove advantageous for the reasons set out below.

First, the existing legal framework outlines information and consultation mechanisms that entail the involvement of workers and their representatives.[121] In several EU countries such as Italy, Spain and Germany, while employee monitoring is mostly justified for legitimate business purposes, the introduction of devices with data capturing capabilities is required to follow prior information and consultation or co-determination procedures that provide worker representatives with a say and even a veto as regards the aims and mechanisms of data management. This involvement must be performed from the earliest phases when companies are considering the installation or revision of electronic devices. Moreover, this procedural requirement lays the foundation of lawfulness for data collection and processing (Article 5, GDPR) to be supported by proof of necessity of company interests. Prior notice is necessary for the data processing to be legitimate and proportionate. Failure to comply with these requirements can result in the prohibition of using information unlawfully captured and lead to sanctions.

(preferences expressed by customers in rating and scoring should not lawfully inform workers' pay or influence their working conditions in discriminatory ways).

119 Pauline Kim, *Auditing Algorithms for Discrimination*, 166 U. Pa. L. Rev. Online 189–203 (2017).

120 Alessandro Mantelero, *From Group Privacy to Collective Privacy: Towards a New Dimension of Privacy and Data Protection in the Big Data Era*, in *Group Privacy: New Challenges of Data Technologies* 139–158 (Linnet Taylor, Bart van der Sloot & Luciano Floridi eds, Springer 2017).

121 Directive 2002/14/EC of the European Parliament and of the Council of 11 Mar. 2002 establishing a general framework for informing and consulting employees in the EC.

It has rightly been argued that social dialogue and other participatory methods can have a greater impact than technological solutionist fixes 'through further data collection and algorithmic sophistication'.[122] Industry-wide and company-level collective bargaining agreements that are sufficiently comprehensive to include rules on the adoption and deployment of technologies such as ADMS can outsmart the current '*ex post* damage-control approach',[123] so long as they are meaningfully implemented using practices such as inspections, minimization, correction and erasure. Responsive methods have succeeded in accelerating adaptation to the changing world of work in numerous fields.[124] The European Social Partners' Framework Agreement on Digitalisation (FAD), concluded in 2020, calls for the implementation of the 'human in control principle', claiming that AI applications must 'be transparent and explicable with effective oversight [depending on] the context, severity and consequences' (Article 3, FAD).[125] With regard to HRM practices, the FAD requires data transparency, while stating that workers have the right to human intervention, objection and the 'testing of the AI outcomes'.[126]

The GDPR states that Member States may introduce, either by law or by collective agreement, 'specific rules to ensure the protection of the rights and freedoms in respect of the processing of employees' personal data in the employment context' with the aim of overriding fully or semi-automated decision-making processes. Such rules are required to comprise 'suitable and specific measures to safeguard the data subject's human dignity, legitimate interests and fundamental rights', including equality (Article 88, GDPR). These measures should be read as the *sine qua non* of the legitimate exercise of managerial power. In two recent ruling handed down against the platforms Glovo and Deliveroo, the Italian data protection authority (*Garante Privacy*) interpreted the GDPR provisions concerning lawfulness and data processing in the context of employment as making a reference to rules laid down in the Workers' Statute of 1970, which provides a more protective system than the GDPR framework.[127] Article 88 of the GDPR

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[122] Lina Dencik, *Towards Data Justice Unionism? A Labour Perspective on AI Governance*, in *AI for Everyone? Critical Perspectives* 274 (Pieter Verdegem ed., University of Westminster Press 2021).

[123] Valerio De Stefano & Simon Taes, *Algorithmic Management and Collective Bargaining*, ETUI Foresight Brief (2021).

[124] OECD, *Negotiating Our Way Up: Collective Bargaining in a Changing World of Work* (OECD Publishing 2019); Barbora Černušáková, *Collectively Against Workers' Surveillance*, paper presented at IE Lawtomation Days, 29–30 Sep. 2022, Madrid.

[125] https://bit.ly/3xCsXK3 (accessed 20 Mar. 2023). David Mangan, *Agreement to Discuss: The Social Partners Address the Digitalisation of Work*, 50 Indus. L.J. 689–705 (2021). *See also* European Social Dialogue Work Programme 2022–2024, https://bit.ly/3qMIAtp (accessed 20 Mar. 2023).

[126] TUC, *When AI Is the Boss: An Introduction for Union Reps* (TUC 2021); Prospect, *Data Protection Impact Assessments: A Union Guide* (Prospect 2020); Lighthouse, *A Guide to Good Data Stewardship for Trade Unions* (Lighthouse 2021); UNI Europa, *Algorithmic Management – A Trade Union Guide* (UNI Europa 2020).

[127] *See also* Art. 58(1) of the GDPR. Italian data protection authority, 10 Jun. 2021, No. 234; Italian data protection authority, 22 Jul. 2021, No. 285.

was read as enabling rigorous national requirements mandating the prior involvement of worker representatives or otherwise of administrative bodies as a precondition for the introduction of technologies that may result in surveillance and profiling, reinforcing co-determination rights.[128]

At the national level, Spain has gone so far as to include a right for workers' representatives to be informed by companies about the parameters, rules and metrics factored in by algorithms that are used to make legally relevant decisions that affect individuals.[129] Similarly, the proposed EU Platform Work Directive imposes information and consultation of platform workers' representatives on digital platforms concerning automated monitoring and decision-making systems.[130] All platform workers must be informed about the adoption of such algorithms, the categories of activities monitored, supervised or evaluated,[131] the types of decisions made, the parameters considered and their relative weighting, and the motivation behind any decision that impacts the worker's 'contractual status or any decision with similar effects'.

Second, data protection and equality laws empower the bodies that represent legitimate collective interests, both at the level of participation in multistakeholder risk-assessment procedures and in the *ex-post* litigation.[132] This is consistent with data protection co-governance tools and should contribute to elucidating potential discriminatory risks. The assumption is that having workers 'on board' streamlines processes and ensures compliance. Perceived as institutional 'data clearing houses' or even as 'data cooperatives' *avant la lettre*,[133] works councils and shop-floor worker representation bodies are intended to facilitate the knowledge sharing process. This information transfer is all the more important in asymmetric situations where turnover, short-lived contracts and decentralized teams impair the ability to understand whether the unfair treatment has been or is likely to occur. Together with trade unions, whether long-established or grassroots, worker representatives at company level can help to lower the barrier for 'individuals without

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[128] Halefom H. Abraha, *A Pragmatic Compromise? The Role of Article 88 GDPR in Upholding Privacy in the Workplace*, 12 Int. Data Priv. Law 276–296 (2022).

[129] *Real Decreto-ley 9/2021, de 11 de mayo, para garantizar los derechos laborales de las personas dedicadas al reparto en el ámbito de plataformas digitales*, 113 BOE 56733 (2021). *See also* Guide to corporate obligations on the use of algorithmic information in the workplace and instrument for practical application (May 2022), https://prensa.mites.gob.es/WebPrensa/noticias/laboral/detalle/4125 (accessed 20 Mar. 2023).

[130] Article 9, Proposal for a Directive of the European Parliament and of the Council on improving working conditions in platform work COM(2021) 762 final 2021/0414.

[131] Article 6(2), Proposal for a Directive of the European Parliament and of the Council on improving working conditions in platform work COM(2021) 762 final 2021/0414.

[132] The All Party Parliamentary Group for the Future of Work, *The New Frontier: Artificial Intelligence at Work* (2021), https://bit.ly/3dSsE2o (accessed 20 Mar. 2023).

[133] Katharine Miller, *Radical Proposal: Data Cooperatives Could Give us More Power Over Our Data, Human-Centered Artificial Intelligence* (Stanford University 20 Oct. 2021).

specialized knowledge' and collect 'convenient evidence for a fact finder'[134] in barely accessible matters, while supporting judicial discovery in non-discrimination proceedings thanks to their longitudinal viewpoint. Other effective tactics may include public contestation to elicit 'market mechanisms or regulatory feedback from the public or oversight by external experts'.[135]

In the case of friction, trade unions and non-profit bodies can be delegated to act on behalf of workers when it comes to lodging data protection or non-discrimination complaints with a supervisory authority or pursuing a judicial remedy.[136] Trade union representatives can also file a claim before a court or exercise a data protection right before the employer or the data protection authority 'independently of a data subject's mandate' (Article 80, GDPR). In several EU jurisdictions, the lack of an identifiable claimant does not constitute an obstacle for collective actors such as trade unions in discrimination proceedings.[137] The importance of strategic litigation is further demonstrated by the fact that preliminary judicial successes with regard to holding platforms or companies adopting algorithms accountable have stemmed from union-led initiatives with stronger deterrent effects than individual claims.[138]

Finally, there is perhaps a less discussed motivation justifying the need to collectively engage with workplace technology. Co-designing the implementation of the ADMS used for scheduling, performance evaluation and work assignment, as well as the way in which they operate, may prove particularly beneficial in terms of the physical and mental health of workers and, relatedly, business productivity.[139] Worker representatives are well placed to draw up internal rules due to their capacity-building and vast knowledge of operational practices. Hence, the active participation of workers confers several types of advantages on businesses. Given the correspondence between the designer of the assessment model and the individuals subject to evaluation, noisy and misleading metrics that

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134 Ari Ezra Waldman, *Power, Process, and Automated Decision-Making*, 88 Fordham L. Rev. 629 (2019).

135 Kaminski & Malgieri, n. 64.

136 For example, *see* Art. 9(2) of Council Directive 2000/78/EC of 27 Nov. 2000 establishing a general framework for equal treatment in employment and occupation. The same rights are laid down in the proposed EU Platform Work Directive (Art. 14), which enables trade unions entitled to 'act on behalf or in support' of a person or several persons. *See* Zane Rasnača, *Collective Redress for the Enforcement of Labour Law*, 12 Eur. Lab. L.J. 405–414 (2021).

137 Christina Hießl, *Case Law on Algorithmic Management at the Workplace: Cross-European Comparative Analysis and Tentative Conclusions* (European Commission, Directorate DG Employment, Social Affairs and Inclusion 2021).

138 Reventlow, *Making Accountability Real: Strategic Litigation*, Digital Freedom Fund (30 Jan. 2020), https://digitalfreedomfund.org/making-accountability-real-strategic-litigation/ (accessed 20 Mar. 2023); AI Now Institute, *Litigating Algorithms: Challenging Government Use of Algorithmic Decision Systems* (2018).

139 Douglas Zytko, Pamela J. Wisniewski, Shion Guha, Eric P. S. Baumer & Min Kyung Lee, *Participatory Algorithmic Management: Elicitation Methods for Worker Well-Being Models*, Proceedings of the AAAI/ACM Conference on AI, Ethics, and Society 715–726 (2021).

capture erroneous parameters can be excluded. Additionally, due to peer knowledge of the ADMS, workers are discouraged from gaming the model because their colleagues would be likely to respond in a reciprocal manner.

When their autonomy is strengthened, workers feel empowered 'to improve the measurement properties rather than risk the imposition of metrics that poorly reflect the operational characteristics of their work'.[140] Harnessing their full potential in terms of improving the overall work experience and enhancing the general well-being would require employees to be provided with latitude in deciding what is to be measured and how. A survey of union members revealed that one in two felt that 'better consultation would make technology more effective'.[141] On the other hand, introducing technology-enabled models with the sole aim of monitoring, imposing sanctions or reducing costs could prompt a negative reaction. Worker-centric workplace practices might increase employees' efforts and enhance their performance through confidence and job enrichment, thereby fostering a positive social identity. This should ensure that mutual trust flourishes, thus avoiding any loss of competitiveness and engagement.

Although the importance of mastering digital literacy cannot be underestimated, worker involvement does not necessarily presuppose the ability to 'speak' computational language. Rather, what is important is the ability to expose, document and influence the logic underlying automated systems while enforcing the full range of available legal solutions intended to counterbalance the magnitude of employer powers.[142] Notably, the proposed EU Platform Work Directive also provides for the possibility of assistance by an expert chosen by workers in the platform economy or their representatives to examine the matter that is subject to information and consultation and formulate an informed opinion (Article 9).

Taken together, these points highlight the importance of changing perspectives. It has been claimed that algorithmic management 'harms typically arise from how systems classify and stigmatise groups'.[143] This intrinsic 'data network effect' requires responses at the collective level, which is generally a neglected dimension when it is not undermined either in an open or a surreptitious way. Leaving workers to their own devices could result in the exacerbation of current perils, to say nothing of the constant legal uncertainty that developers, providers and users

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[140] Bianca A. C. Groen, Marc Wouters & Celeste P. M. Wilderom, *Employee Participation, Performance Metrics, and Job Performance: A Survey Study Based on Self-Determination Theory*, 36 Mgmt. Acct. Res. 54 (2017). *See also* C. Scott Rigby & Richard M. Ryan, *Self-Determination Theory in Human Resource Development: New Directions and Practical Considerations*, 20 Adv. Dev. Hum. Res. 133–147 (2018).

[141] Abigail Gilbert & Anna Thomas, *The Amazonian Era: How Algorithmic Systems are Eroding Good Work* 29 (Institute for the Future of Work 2021).

[142] Alessandro Mantelero, *Artificial Intelligence and Data Protection: Challenges and Possible Remedies* (EU Directorate General of Human Rights and Rule of Law 2019).

[143] Edwards & Veale, n. 58.

would all face. On the contrary, bringing workers and their representatives to the table when algorithmic management practices are designed, developed and deployed may well ensure more benign uses of workplace technologies.

4 FINAL REMARKS

Algorithms are playing the role of managers and becoming involved in all critical workplace decisions due to the tentacular infrastructure for capturing data. Following the emergence of concentrated, highly bureaucratic and vertical entities, employment-related limits have evolved to cater for the transformation of production models and the parallel intensification of the power of employers. Their main purpose has been to extend worker freedom by supporting and restraining the authority of management, in whatever way it may be exercised. The most recent shift calls into question the suitability of canonical safeguards that have been calibrated upon a less insidious form of power. Rather than postulating the obsolescence of existing legislation or denouncing its capacity to obstruct innovation, it must be admitted that data protection and equality law include legal elements that can facilitate adaptation to fast-paced digitized environments by heightening the speed of reactions to new modes of workplace governance.

To address the crisis of legitimacy that AI-driven management may suffer, it is important to combine data protection, equality law and participatory rights, rather than to view them as mutually incompatible. The preceding sections outlined several GDPR and non-discrimination provisions that, far from being symbolic, can be jointly read to render data-driven practices accountable and contestable. Such tools need to be applied in a pragmatic and elastic manner to offer responses to the challenges posed by the advent of management by algorithm. This article argued in favour of multi-layered, collaborative structures that promote compliance with existing legal frameworks *ex ante*, rather than retrospectively, so as to counter the rise of management power before it materializes in practice, producing detrimental effects for workers and legal uncertainties for those adopting new technology. Both labour courts and data protection authorities, acting as quasi-judicial bodies in their spheres of competence, have demonstrated that it is possible to combine elements from different thematic areas, thus crafting future-proof legal mechanisms.

As previously argued, workers can rely on process-oriented mechanisms such as the DPIA and the information and access rights afforded by the GDPR to regain sovereignty and control over their personal data. In addition to a 'right not to be subject' to automated decision-making, workers can count on additional rights such as human intervention on the part of the data controller, explanation and contestation when it comes to safeguarding their rights, freedoms and legitimate

interests. Concomitantly, equality law offers other potentially effective instruments, including discrimination by proxy or association, legal presumptions and the reversal of the burden of proof. These remedies may prove more fruitful than reconstructing the intricate procedures of a specific algorithm, something that is often overemphasized at the expense of promoting compliant business practices.

However, data protection law is too often conceived as 'defensive in nature',[144] and thus partially ill-suited when it comes to addressing the dynamics underpinning digital HRM. At the same time, non-discrimination rules struggle to capture the disparate effects stemming from practices affecting individuals with characteristics outside the traditional circle of protected grounds. Additional limitations concern access to evidence when information is unevenly distributed. Moreover, both sets of rights have predominantly been interpreted as individual entitlements, with little focus on social solidarity.[145]

These process-based strategies are bound to fail if implemented solely from an individualized perspective and almost exclusively in a reactive manner. Workplace data are intrinsically and eminently relational, plural and built on 'population-level insights regarding how data subjects relate to others, not individual insights specific to the data subject'.[146] Predictions and prescriptions see workers as 'assemblages of their social relations and group behaviors'.[147] At the personal level, data are of little value: decisions concerning workers are made by means of profiling, comparisons, scoring and clustering, often without informing individuals about their being placed in a given class. The task of taming the domination exerted by management by algorithm over employees requires the practical mobilization of convergent regulation to exercise power in a bottom-up fashion, as managerial functions primarily impact categories and groups.[148] Thus, it is vital to rely on controlling factors that are deployed in the collective dimension as they have a greater impact in terms of facilitating knowledge sharing, lowering administrative costs, achieving far-reaching deterrent effects and minimizing the risks of retaliation.

This article argued that the complexity of AI-driven tools must be addressed beyond thematic boundaries and idiosyncratic approaches. This has already started

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144 Ilaria Armaroli & Emanuele Dagnino, *A Seat at the Table: Negotiating Data Processing in the Workplace. A National Case Study and Comparative Insights*, 41 Comp. Lab. L. Pol'y J. 179–195 (2019).

145 Raphaël Gellert, Katja de Vries, Paul de Hert & Serge Gutwirth, *A Comparative Analysis of Anti-discrimination and Data Protection Legislations*, in *Discrimination and Privacy in the Information Society* 61–89 (Bart Custers, Toon Calders, Bart Schermer & Tal Zarsky eds, Springer 2013). *See also* Karen Yeung, Andrew Howes & Ganna Pogrebna, *AI Governance by Human Rights-Centered Design, Deliberation, and Oversight*, in *The Oxford Handbook of Ethics of AI* (Markus D. Dubber, Frank Pasquale & Sunit Das eds, Oxford University Press 2020); Karin Mika, *Privacy in the Workplace: Are Collective Bargaining Agreements a Place to Start Formulating More Uniform Standards*, 49 Willamette L. Rev. 251–274 (2012).

146 Salome Viljoen, *Democratic Data: A Relational Theory for Data Governance*, 13 Yale L.J. 578 (2021).

147 Viljoen, n. 146.

148 Brent Mittelstadt, *From Individual to Group Privacy in Big Data Analytics*, 30 Phil. Tech. 475–494 (2017).

to take place, as demonstrated by many collective agreements and cases of strategic litigation. Labour law instruments have attempted to keep abreast of the 'human-in-command' function in an integrationist sense by means of alliance with adjacent disciplines such as data protection and equality law.[149] Hence, an inventive blend of old and modern guardrails can play a crucial role amid the current (and future) turbulence arising from management by algorithm.

[149] Antonio Aloisi & Valerio De Stefano, *Your Boss Is an Algorithm: Artificial Intelligence, Platform Work and Labour* (Hart 2022); Deirdre McCann & Arely Cruz-Santiago, *Labour/data justice: a new framework for labour/regulatory datafication,* 49 J. Law Soc. 658–680 (2022).