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ALGORITHMS BY AND FOR THE WORKERS

TOWARDS A FAIR, DEMOCRATIC AND HUMANE
DIGITALISATION OF THE WORKPLACE

FEPS and Nordic partners Digital Programme
on Algorithms at the Workplace

Bonn Juego, Tereza Østbø Kuldova and Gerard Rinse Oosterwijk



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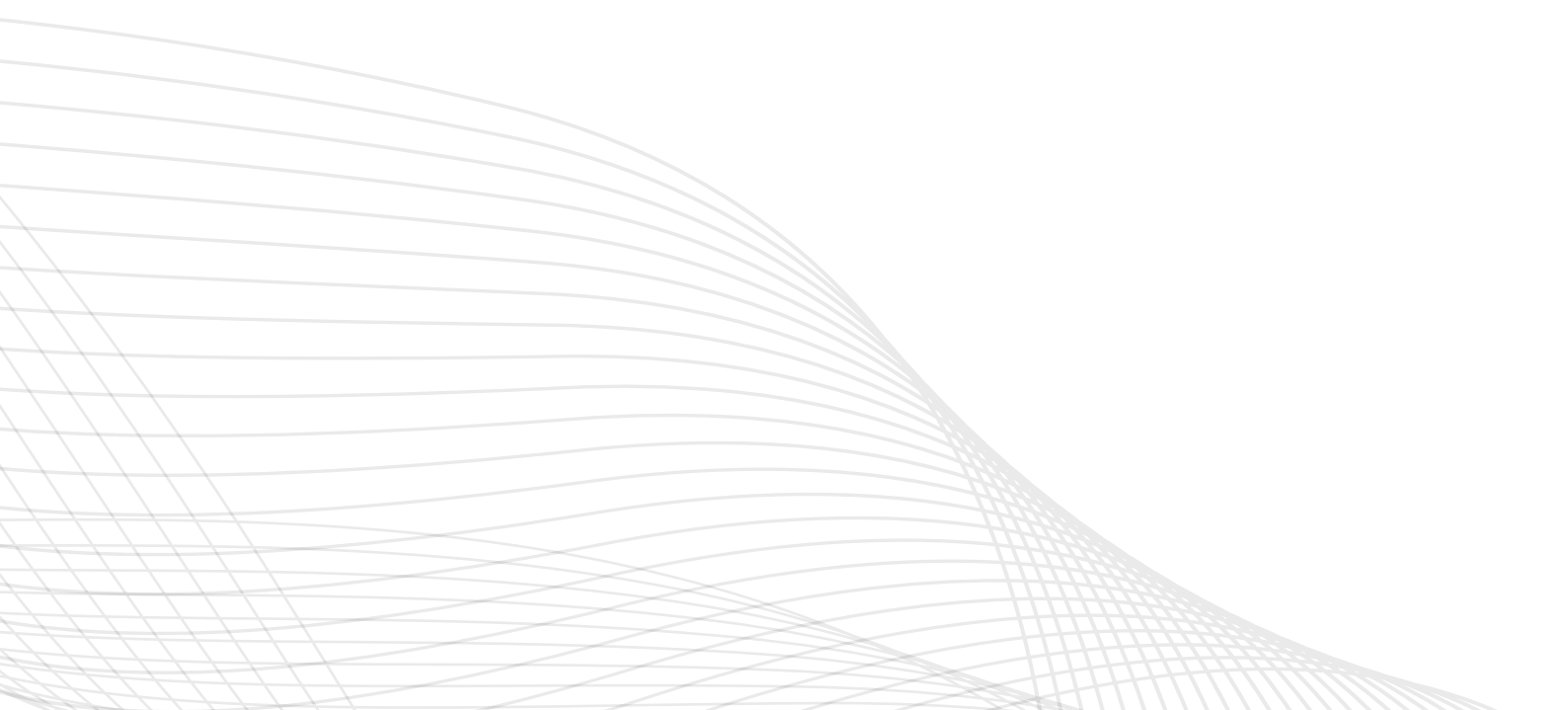


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EXECUTIVE SUMMARY

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This study highlights the complexities and contradictions of Algorithmic Management and the limitations of current policies and institutions in dealing with the fast-paced digital transformation.



Driven by the logic of competition in global capitalism, digitalisation is revolutionising the workplace, introducing both opportunities and challenges. This policy study reflects on the complex interplay between technology and work, focusing on the impacts of algorithmic management (AM) techniques on workers' rights, dignity and well-being. Drawing on preliminary findings from an ongoing study of the Foundation for European Progressive Studies in collaboration with Nordic-based partners, which includes a review of relevant literature and consultation with stakeholders among trade unions, policymakers and academics, the policy study highlights the complexities and contradictions of AM, and the limitations of current

policies and institutions in dealing with the fast-paced digital transformation. It emphasises the importance of worker agency and participation in the innovation process, proposing the need to create socio-institutional frameworks to direct a pro-labour digital transition and institutionalise co-determination as a viable solution for workers to actively engage with incessant technical changes. It concludes with a forward-looking perspective, advocating for research methodologies and problem-solving approaches that cater to the needs of diverse working contexts. The purpose is to contribute to informed policymaking that ensures a fair, democratic and humane work environment in the digital age.



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SECURITY

INTRODUCTION

INTRODUCTION



Today's worker finds their daily rhythms orchestrated by electronic algorithms, and their economic worth and performance appraised by often invisible and "black-box" without any opportunity for negotiation or discussion.



In the era of the globalisation of competitive capitalism, the unyielding quest for optimisation, effectivisation and profitability is driving technological innovation. This dynamic is profoundly transforming the structure and nature of work across the globe. Digitalisation, defined as the pervasive integration of digital technologies into the socio-economy, is a transformative force underpinning these changes in labour relations in industrialised and developing economies alike. A key manifestation of this digital transformation is the use of algorithms – computer-programmed codes and procedures – to coordinate labour inputs and outputs by monitoring, evaluating and controlling workers' behaviour and performance, often in granular detail. This process, known as **algorithmic management (AM)**, has significant implications for work organisation, working conditions, workers' rights and social dialogue.¹

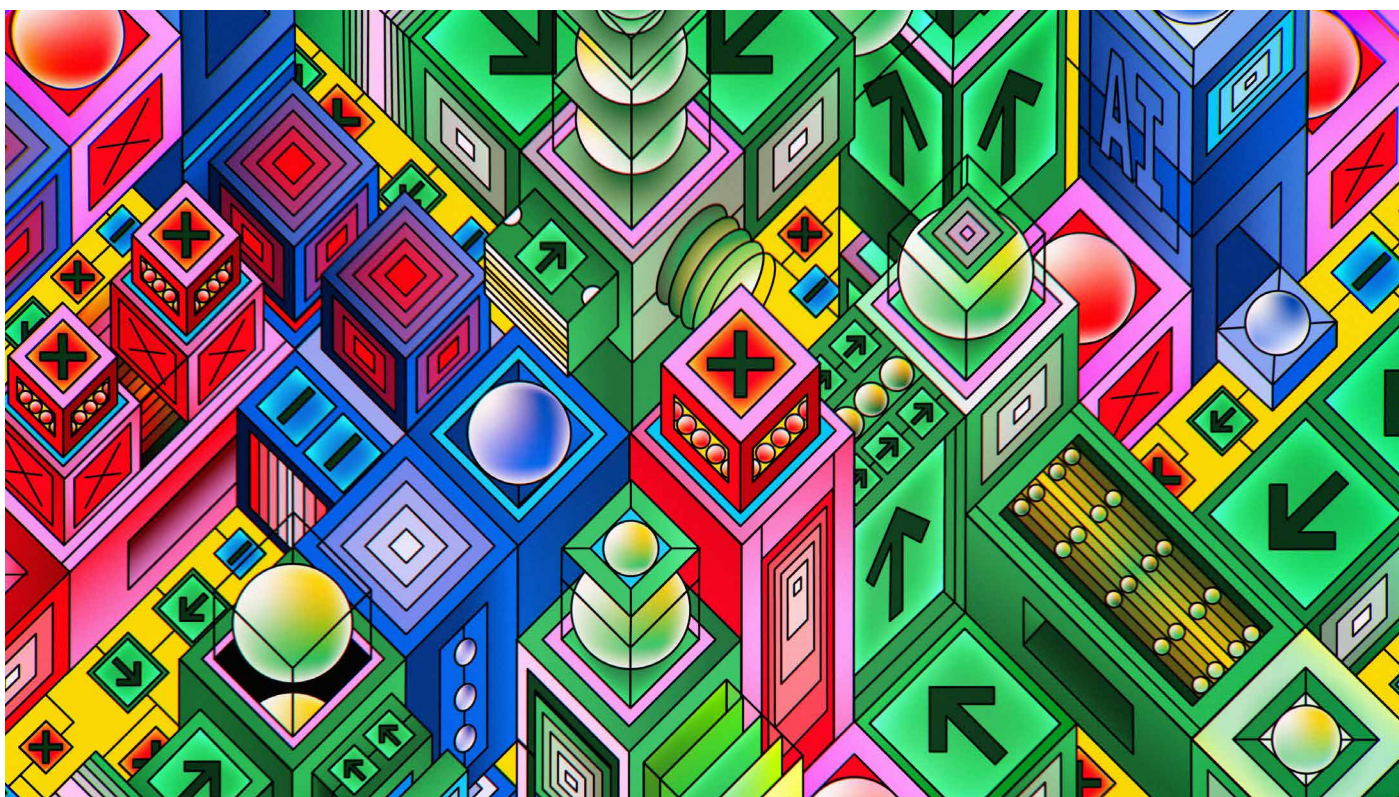
AM is not merely about the utilisation of innovative technological tools to boost business performance. It also serves as an organisational mechanism that affects power relations in the workplace and the quality of life of workers. Today's worker, once familiar with conventional hierarchies and tangible company structures, now finds their daily rhythms orchestrated by electronic algorithms, and their economic worth and performance appraised by often invisible and "black-box"² lines of code and by software that brings in new features – some with profound impacts on their work – added

through regular updates without any opportunity for negotiation or discussion. An example of this is the artificial intelligence (AI)-powered Microsoft Copilot, which, despite common predictions that it will transform working relations, appears to be rarely discussed with trade union representatives prior to implementation. As the digital panorama unfolds and morphs around workers, the process of digitalisation – particularly the embedding of algorithmic techniques into organisational structures – creates a tapestry of opportunities and challenges. On one hand, it projects unparalleled efficiency, heightened productivity and data-driven objectivity in business activities and decisions. On the other, it generates threats and concerns about further labour exploitation, work intensification,³ obscured employer accountability for workers' rights, increased information asymmetry between employer and workers (including their representatives), and potential (automated or semi-automated) discrimination⁴ against specific segments of the working population during employment and recruitment. Numerous reports have meticulously documented the use of intrusive surveillance technologies and software products in workplaces across Europe. These include algorithmic control and automated management systems employed in sectors such as call centres,⁵ retail and hospitality.⁶ As a result, there is a growing call for the establishment of technology rights for workers and stronger protective measures.⁷

Workers today are compelled to navigate the digital frontier. They stand at the forefront of a dramatic shift in employment dynamics brought about by digitalisation. AM represents the deployment of algorithms to govern and optimise the workplace, as well as to dictate work patterns and discipline, monitor, surveil and sanction workers.⁸ As such, algorithms themselves can increasingly be viewed as both work designers⁹ and bosses.¹⁰ While the algorithm is designed to optimise efficiency and maximise profitability for the firm, it orchestrates every aspect of the worker's routine, including break times and task allocation. However, it arguably lacks empathy, fails to account for the nuances of human experience, overlooks aspects that are not and cannot be recorded by the system, and undermines traditional negotiation practices in employer-employee relationships. With advances in information technology and data science shaping new corporate management techniques, the very essence of human labour is implicated.¹¹ This prompts a need for careful consideration of technical

innovation processes, policy formulation and governance institutions to ensure the humaneness and fairness of work in the digital age.

This policy study draws on preliminary research findings, including literature reviews and consultations with stakeholders – among trade unionists, policymakers and academics – of the Digital Programme of the Foundation for European Progressive Studies (FEPS) and its Nordic-based partners. It focuses on the implications of digitalisation for the modern workplace. The aim is to contribute to discussions in the current policy landscape, which faces the challenge of regulating the AM phenomenon for the well-being of both the economy and workers. Specifically, the installation of algorithmic systems introduces a plethora of complexities, pros and cons, contradictions and conflicts, for workplaces globally. The benefits and risks of recent technological innovations, such as AI, intersect with fundamental principles of decent, fair and just work. Indeed, the intersection of technology

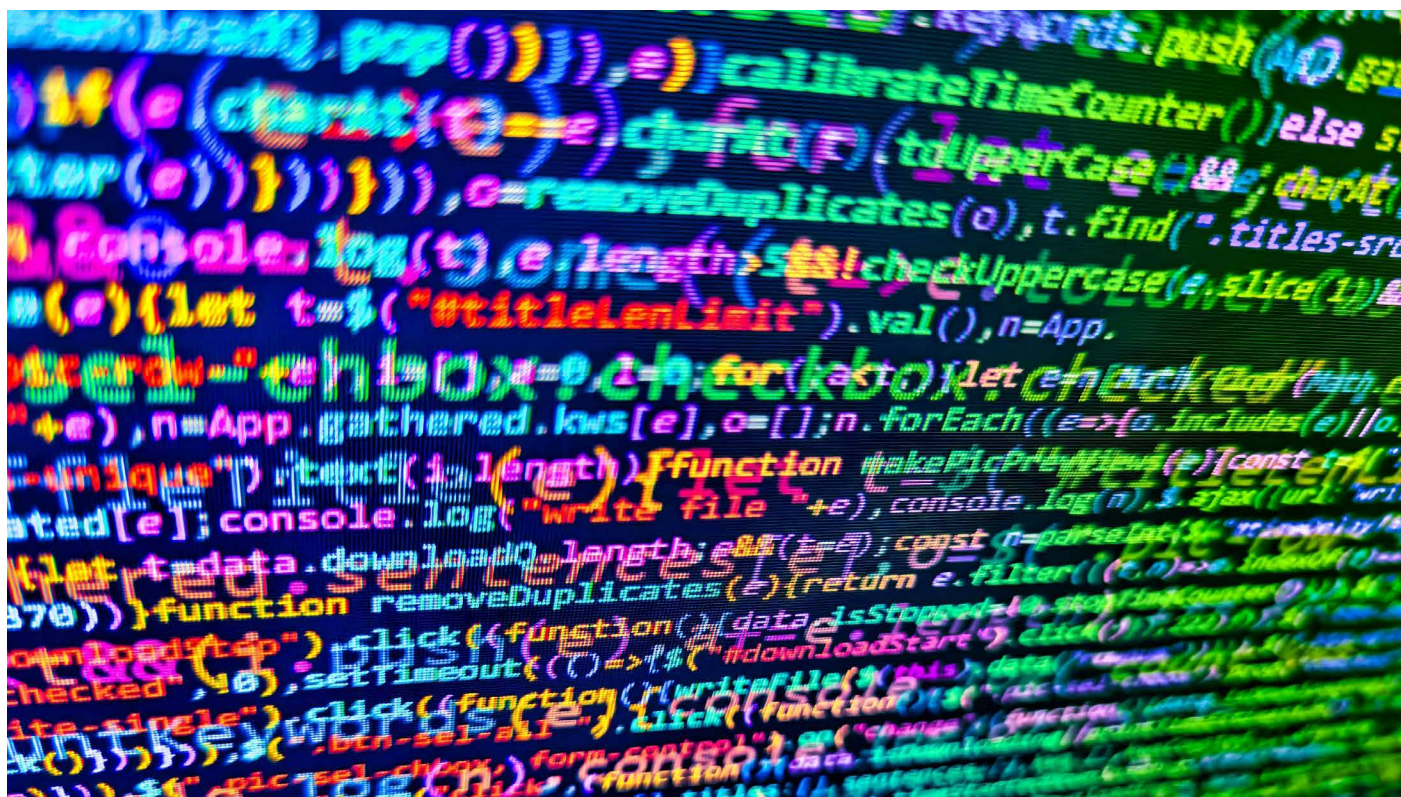


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and labour is more pronounced and complicated at this time when the capitalist production system – with its imperatives of competition, efficiency and profit – has reached a truly global scale.¹²

The discussions in this policy study are organised into four interconnected sections, reflecting on the challenges and opportunities for workers arising from the digital transformation of the workplace. Firstly, it introduces the rise and overarching impact of algorithms and digitalisation on workers' rights. Secondly, it explores the limitations of current policies and institutions in dealing with the fast-changing digitalisation process and argues for the need to build a socio-institutional framework and public institutions that can steer a pro-worker digital transition. Thirdly, it thus brings attention to the critical aspect of worker agency, participation and co-determination in the innovation process, going beyond problem identification and exploring the possibilities that lie in the concept and practice of co-determination, in particular as practiced in

the Nordic countries. Lastly, it offers a forward-looking perspective, emphasising the significance of research methodologies that are aligned with the specific needs of diverse workplaces and problem-solving approaches with mission orientation – all of which are essential components for informed policymaking.



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THE RISE OF ALGORITHMS IN CAPITALISM AND THE CHALLENGES OF DIGITALISATION TO WORKERS' RIGHTS

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Technologies are not neutral. On the contrary, software products are programmed with particular world views, premises, and data sets that reflect particular normativity, managerial principles and interests.



As increased capitalist competition drives the evolution of digital technology, modern workplaces are acquiring and implementing novel approaches to management, fundamentally altering the dynamics between employers and employees across various sectors. At the forefront of this techno-managerial shift is AM, a concept emerging at the interface of AI and organisational dynamics.¹³ Defined as the delegation of management tasks to algorithms, this paradigm has the potential to streamline operations, expedite decision-making and provide data-driven insights.¹⁴ Yet, amidst the excitement surrounding its benefits, AM also introduces complex challenges, particularly in terms of altered power relations, ethics and worker well-being.¹⁵

The inception of AM can be traced to the convergence of competitive demands of businesses and technological advancements within the context of globalising capitalism. The AM phenomenon is a manifestation of the logic of capitalist competition, where technical innovations are sought to reduce costs, increase productivity and maximise profits by exploiting labour.¹⁶ Companies, seeking to enhance operational efficiency, have increasingly employed algorithms to automate both simple and increasingly complex tasks that used to rely on human intervention.

For instance, the hiring process is transforming, with algorithms rationalising candidate evaluation. Algorithmic systems promise neutral and objective insights into employee performance, ostensibly minimising biases inherent in human judgment,¹⁷ but often they prove to be far from objective, instead reproducing and even reinforcing pre-existing biases or creating new ones, resulting in algorithmic discrimination.¹⁸ Technologies are of course not neutral. On the contrary, software products are programmed with particular and partial world views, categories, premises and data sets that reflect particular normativities, managerial principles and interests. These may not align with the interests of workers.¹⁹ Hence, beneath the surface of this tidal wave of innovation lies crucial concerns that cannot be ignored.

The ethical implications of algorithmic decision-making are a pressing issue. Instances of biased algorithms that perpetuate inequality and favour specific demographic groups have garnered significant attention,²⁰ leading to calls for ethical guidelines and regulations to ensure fairness in algorithmic design and preserve worker autonomy.²¹ However, many algorithm management and software products currently on the market continue



Algorithmic Management is not limited to the gig economy; it has become prevalent in traditional organisations where algorithms perform various managerial functions, and data-driven, algorithmically generated insights are used as decision-making support for managers.



to be programmed on bogus, pseudoscientific or long-discarded scientific theories,²² as much as biased data sets. Naturally, challenging these technologies and their epistemological premises can be difficult for workers and policymakers. Moreover, researchers are already revealing the limits of embedding notions such as fairness into algorithms themselves, a concept known as “fairness by design”, and questioning its possible positive impacts.²³ The questions that will eventually arise will focus on how to prevent algorithmic auditing and AI ethics from becoming a new form of “algorithmic washing”, without any substantial impact on rectifying algorithmic injustices and harms, especially in the workplace.

As a result of the digitalisation of the economy and society in the epoch of globalisation, AM has emerged in both digital labour platforms and regular workplaces. Under AM, algorithms and AI determine tasks and merits of human workers. Early innovators in digital platforms, such as the ride-hailing services Uber,²⁴ the online food delivery company Deliveroo and the freelance marketplace UpWork, utilise software algorithms to coordinate, evaluate and incentivise their global workforce. Notable examples of AM in big US corporations are as follows: UPS’s use of sensors to track the movements and productivity of its drivers, providing them with real-time feedback and instructions on how to optimise their routes and deliveries; Amazon’s use of algorithms to monitor the performance of its warehouse workers, automatically generating termination notices for those who fail to meet targets;²⁵ HireVue’s use of AI in its recruitment platform to analyse the facial expressions, voices and language of job candidates in video interviews,

giving scores and recommendations to employers; and Netflix’s use of algorithms to personalise the content suggestions for its users and to evaluate the performance and potential of its employees.²⁶

Today, AM is not limited to the gig economy; it has become prevalent in traditional organisations where algorithms perform various managerial functions and data-driven, algorithmically generated insights are used as decision-making support for managers. Innovations in digital tech – from cloud computing and big data analysis to machine learning and language models – have enabled AM. These technologies have built-in learning algorithms that can carry out functions traditionally performed by human managers. AM has been applied in different sectors like online work, banking and financial services, transportation, delivery, manufacturing, healthcare, supply chain management, education and more.

The conceptualisation of AM is linked to the historical principles of scientific management and Taylorism, which sought to optimise work processes and enhance efficiency through standardisation, measurement and control.²⁷ However, what sets AM apart from other forms of management is its delegation of significant autonomous authority to automated systems. These systems collect and process large amounts of data in real time and make decisions based on complex rules and criteria.²⁸ AM also signifies a shift from direct, personal supervision to indirect, impersonal surveillance, where workers are monitored and evaluated by algorithmising metrics and ratings.²⁹ Furthermore, unlike in Taylorism, the measurements in AM are

far more granular, and the measurement criteria are often opaque and a black box, not only for workers, but also for managers.

A serious concern regarding the impact of digitalisation on workers' rights is the opacity surrounding the automated nature of algorithmic decision-making processes. As the algorithm defines task assignments, performance evaluations and resource allocation, the lack of transparency raises questions about accountability and fairness.³⁰ The risk of perpetuating biases, whether intentional or not, threatens to compromise the principles of equal opportunities and non-discrimination. The asymmetry of information may be aggravated in algorithmically managed organisations, negatively impacting power dynamics within employment relationships. AM can amplify imbalances by skewing, if not concentrating, decisions in favour of employers. The implications for workers, whose autonomy may be curtailed, demand a recalibration of regulatory frameworks to ensure that technological advancements do not infringe upon labour rights, privacy rights and the human rights of workers.

Simultaneously, the global dimension of the digitalisation challenge is accentuated by the varying economic, legal and regulatory contexts in which algorithmic systems operate. In industrialised and high-tech countries, workers may confront issues of privacy, surveillance and job security. In emerging economies, the adoption of new technologies without necessary regulation may exacerbate the precarity of the already vulnerable workforce. For example, algorithmic quantification, algorithmised task allocation, wage determination and performance evaluation in the gig economy have been shown to stimulate a sense of meaninglessness of work for crowdworkers and create uncertainty, instability and inequality for gig workers and other platform workers.³¹ Similarly, studies have revealed how algorithmic control, including the irresponsible use of modern tools like machine learning approaches, in traditional work settings – such as call centres, warehouses and factories – increases stress, inequalities, discrimination and alienation of workers, while intensifying work.³² Professionals, on the other hand, find their professional judgement, discretion and autonomy increasingly undermined



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It highlights the need to strengthen national and organisational institutions, increase trade union density, guarantee trade union rights across jurisdictions, and adopt a more equitable and transparent approach to digitalisation and Algorithmic Management at both the global and national regulatory regimes.



by algorithmic and digital systems.³³ Moreover, the increased datafication and quantification of work enabled by big data may lead to the proliferation of “perverse incentives”, stimulating new practices of gaming various metrics. This could result in breaches of professional codes of ethics and even fraud, paradoxically incentivised by the algorithmic architectures and forms of measurement which privilege certain metrics over others.³⁴

The dynamics at both national and organisational levels are equally important. National institutions, legal frameworks, trade union density rates and working cultures, which vary significantly across countries, play a crucial role in shaping and managing the impact of digitalisation. Even when identical software products are introduced, addressing issues regarding how they are implemented, which data are utilised by management, which functions are deactivated and the consequences for workers often depend on national legal institutions and the organisational ability of trade unions to negotiate their concrete use in each instance. Despite this, for example, multinationals, with headquarters outside of the Nordic countries (where there are different managerial traditions, notably with anti-union activities and little understanding of the role of collective agreements), tend to resort to standardised universal “best practices” and “codes of conduct”, externally projecting an ethical image, while evading national laws and undermining local co-determination mechanisms and trade union rights.³⁵ Moreover, even when multinationals comply with stricter national regulations, they can strategically outsource and offshore certain tasks,

often including IT and tech support, to countries like India that lack robust worker and data protection laws and trade unions. This illustrates how workers within the same company may experience vastly different working realities, depending on national contexts. The situation also points to a certain *extraterritoriality* of labour law, workplace customs and “laws of the workplace”, as well as to forms of extraterritoriality “by other means” and global migrations of normativity and regulations in the workplace. All these suggest the need to take into account social facts on the ground and to unsettle exclusively state-centred and legalistic perspectives on labour law.³⁶ It further highlights the need to strengthen national and organisational institutions, increase trade union density, guarantee trade union rights across jurisdictions, and adopt a more equitable and transparent approach to digitalisation and AM at both the global and national regulatory regimes.

Resolving the policy puzzle to regulate the variegated tendencies of digital technology necessitates navigating a convoluted terrain. This demands collective action and international collaboration to craft standardised guidelines, while also allowing for contextual adaptability, and for a foresighted approach to preclude the amplification of socio-economic inequalities. The challenge is to harness the benefits of AM while establishing an effective institutional framework that protects the rights, dignity and well-being of workers in an evolving digital era.

LIMITS OF EXISTING POLICY AND INSTITUTIONAL FRAMEWORKS

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The rapid progression of digital technologies outpaces the formulation of governmental policies, creating a void that Big Tech frequently exploits.



Aside from the existence of competing business interests and political ideologies, the speed, complexity and scope of the advances in digital technologies are complicating efforts of inter-governmental institutions and national governments with diverse legal, socio-cultural and economic-developmental contexts to decide and agree on appropriate institutional frameworks to grapple with incessant technological changes. Mainstream debate and proposals on AI regulation to manage different risk levels of technical innovations has focused more on protecting individual's civil rights, liberties and intellectual property. Less attention is paid to collective rights and to issues concerning real implications of digitalisation – including AI and algorithmic systems – for worker's rights and the general well-being of workers.

The intricate challenges posed by AM demand a comprehensive response. Rapid progression of digital technologies outpaces the formulation of governmental policies, creating a void that Big Tech frequently exploits.³⁷ The first-mover advantages of these resource-rich tech giants in the relentless march of technology, combined with their political-business network of influence, make the process of building institutions to regulate digital technologies susceptible to regulatory capture. Hence, there is an urgent need for immediate policy interventions in favour of labour rights, as well as for future-proofing innovation policymaking that is caring for

workers' well-being. The point of view of worker organisations should inform societal endeavours to find synergy between technology, labour and governance. Meanwhile, private voluntary self-regulatory initiatives and the compliance industry, which are shaped by and cater to the interests of capital, often lay the groundwork for subsequent public regulation.³⁸

From a global perspective, the regulatory maze concerning AM and workers' rights is a patchwork of fragmented initiatives. There is a notable absence of a coherent, cohesive and coordinated standard across states and territorial jurisdictions. Existing policies often lack specificity, resulting in a gap between the theoretical protection afforded to workers and the practical implications of algorithmic systems in the workplace. For example, the International Labour Organization (ILO) and the United Nations have issued some guidelines and resolutions on decent work and human rights in the digital platform economy, but these are not legally binding and do not cover the circumstances of workers under conditions of AM.³⁹

At a regional scale, specifically the EU, the proposed AI Act and the legislated General Data Protection Regulation (GDPR) provide a foundation for *individual* security and privacy concerns related to algorithmic systems, yet they fall short in specifically and comprehensively safeguarding the broader



Labour-oriented measures and strategies could significantly enhance the effectiveness of the GDPR and related policies in regulating Algorithmic Management.



spectrum of workers' rights.⁴⁰ However, the AI Act does not explicitly regulate AM in the workplace or provide specific protections for workers' rights (namely, the right to information, explanation, contestation and participation). Whereas the GDPR regulates the processing of personal data and grants some rights to data subjects (i.e., the right to access, rectify, erase and port their data, and the right to object to automated decision-making), its scope does not apply to non-personal data (e.g., behavioural or performance data). Even though the GDPR is relevant in a labour context, it neither vests collective rights to organised workers, nor confers specific rights to the individual worker (such as the right to know the logic and criteria of algorithmic decisions, or the right to contest and appeal such decisions).

Likewise, the EU Directive on Transparent and Predictable Working Conditions does not directly deal with AM-specific issues concerning workers. This directive, however, has a noble objective for labourers in various forms of employment, providing them with useful information and several rights – to understand the essential aspects of their work, to request more predictable and secure working hours, and to receive training.⁴¹ Nevertheless, trade unions from across Europe have put forward recommendations for the improvement of the GDPR and directive's relevance to the circumstances of working life under AM.⁴² Firstly, equip data controllers and processors with practical tools (e.g., codes of conduct, certification schemes, impact assessments or audits) to aid in GDPR compliance, observe transparency and exact accountability. Secondly, improve support for data subjects (e.g.,

through awareness-raising campaigns, education programmes or legal assistance) to help them understand and effectively exercise their rights and obligations. Thirdly, foster dialogue and cooperation among various stakeholders (including policymakers, regulators, businesses, researchers, civil society and workers' representatives) to facilitate information exchange, conflict resolution and the development of best practices or innovative initiatives for AM. Lastly, strengthen the enforcement and sanctions mechanisms (particularly by increasing the resources and powers of supervisory authorities, enhancing their coordination and cooperation, and imposing more deterrent and proportionate penalties for non-compliance or violations). Collectively, these labour-oriented measures and strategies could significantly enhance the effectiveness of the GDPR and related policies in regulating AM.⁴³

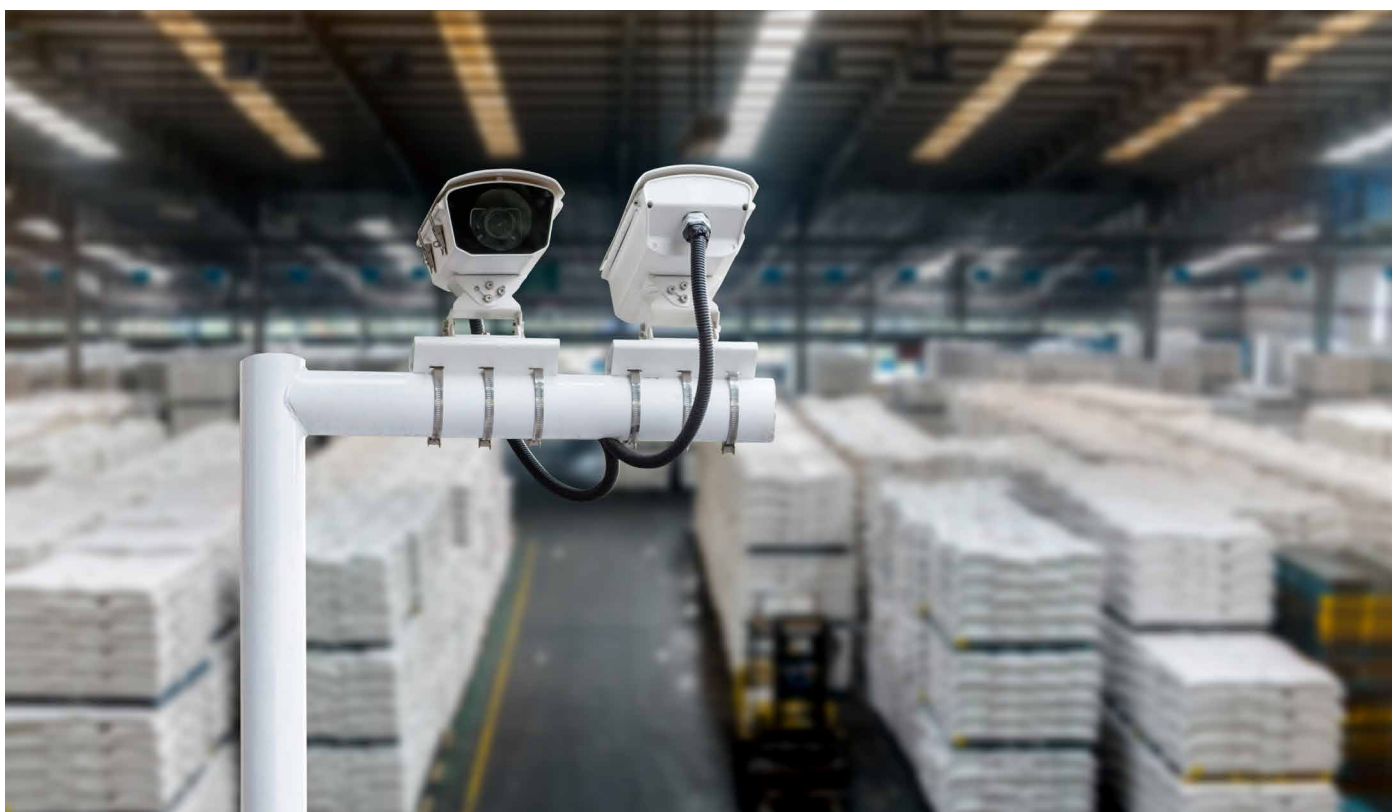
The recently proposed European Platform Work Directive, on which the "trilogues" between the European Commission, the Spanish presidency and Members of the European Parliament had earlier struck a political agreement, could set a significant precedent.⁴⁴ However, the fact that the ambassadors of member states eventually failed to secure a qualified majority to confirm said deal in a Committee of Permanent Representatives is telling of this directive's uncertain future, among other things.⁴⁵ The provisional legal text is formulated to correctly classify the employment status of platform workers, introducing the "presumption of employment relationship", which should benefit at least 5.5 million of them who may have been subjected to "bogus self-employment" without labour and social protection rights.⁴⁶ A chapter on

AM is included to ensure transparency, mandating that workers be informed about the use of automated monitoring and decision-making systems. Digital labour platforms are prohibited from processing personal data of the worker (e.g., psychological state, private conversations, trade union activity, racial or ethnic origin, and migration status) and from using biometric data, except for authentication purposes. Interestingly, these first-ever EU rules on AM in the workplace would embody a human-in-control principle, requiring platforms to be monitored by qualified staff who are protected from adverse treatment. Human oversight is specifically guaranteed for impactful decisions on the platform worker, such as dismissal and account suspension.

In terms of challenges across sectors, the impacts of AM extend beyond the gig economy to traditional industries. While the gig economy provides important lessons (namely, the issues rooted in ineffective legal protection for workers,

weakened bargaining power, absent social security, questionable insurance schemes, inequitable taxation rules, administrative burdens and other regulatory bottlenecks), it is important to understand and address AM's effects in various sectors. The typical firm behaviour of avoiding transaction costs can be expected from algorithm-reliant companies. Thus, they might perceive transparency and accountability requirements as being costly because their digitalised systems would be required to monitor and evaluate not only the outcomes but also the entire business production process, from design to operation and decision-making.

Another emerging issue, due to the vast data available to employers, rapidly evolving technology and unclear guidelines, including the embedding of affective, emotional and biometric AI into AM systems, is "function creep".⁴⁷ This refers to a situation where a technology and its generated data, initially introduced for one purpose, are used for



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Trade unions and works councils are crucial actors in these processes, as they can negotiate and enforce agreements regarding digitised workplaces. However, this requires robust national legal frameworks that empower workers and trade union representatives with the knowledge and skills to cognitively understand Algorithmic Management and consciously engage with digitalisation.



other purposes, such as evaluations during layoffs, performance appraisals and surveillance. It would thus be justifiable to impose stronger sanctions for breaches of the purpose clause under which data was collected.

As the use of digital technologies for AM continues to expand, stakeholders are realising that current policy and regulatory frameworks may not be sufficient to effectively solve the problems at hand. Still, it is crucial to maintain proactive engagement with technology. Policymakers should focus on making digital transitions worker-friendly, with the welfare of workers in design considerations. Notwithstanding the silence of the EU's proposed AI Act on the specifics of digitalisation in the workplace, it classifies systems used in recruitment, HR or worker management tools as high risk due to their potential harm to health, safety and fundamental rights. This classification imposes strict obligations, including mandatory fundamental rights impact assessments, conformity assessments, data governance provisions, registration in an EU database, and the establishment of risk management and quality management systems. It also mandates adherence to principles such as transparency, human oversight, accuracy, robustness and cybersecurity.⁴⁸ Furthermore, the European Commission has announced plans to explore a legislative initiative on AI in the workplace. This involves commissioning an external study to explore potential future policy developments, with the aim of regulating the use of algorithms for managing, monitoring and recruiting

workers.⁴⁹ Yet the plan's implementation should include initiatives that provide clear justifications and transparency for data collection, informed worker involvement in consultations, co-determination and collaboration with technical experts for effective cooperation with employers. The role of social dialogue and collective bargaining is indispensable in creating a worker-centric approach to technology.

Filling in the inadequacies of existing regulations, such as the GDPR, necessitates renewed initiatives at the European, member state and sectoral levels. Legislation needs to be regularly reviewed, amended and adapted to keep up with the evolving nature of technology. A comprehensive legislative framework should encompass all types of technologies used for monitoring, evaluating and managing workers. Trade unions and works councils are crucial actors in these processes, as they can negotiate and enforce agreements regarding digitised workplaces. However, this requires robust national legal frameworks that empower workers and trade union representatives with the knowledge and skills to cognitively understand AM and consciously engage with digitalisation. For instance, in Norway, the role of a dedicated "data shop steward/data trade union representative" is already recognised in the Main Agreement (2022-2025) between the Norwegian Confederation of Trade Unions (LO) and the Confederation of Norwegian Enterprise (NHO). The principal objective is to create conditions where workers are not merely passive subjects of algorithmic control, but active participants in the

innovation process who can negotiate acceptable limits of digitalisation.

Many labour laws, crafted for a pre-digital era, struggle to adapt to the AM complex, the ambiguities of which could potentially be exploited by employers. However, there are “sleeping clauses” in existing legislation and collective agreements that could be invoked in relation to AM. Consequently, policymakers must establish clear rules and build institutions that promote transparency, accountability, worker participation and co-determination in decision-making processes at their digitalised workplaces. A desirable and viable goal would be to adopt the “human-in-command” principle regarding AI, as advocated by the European Economic and Social Committee – the EU advisory body representing civil society organisations, employers and workers. This principle ensures that humans maintain ultimate decision-making authority in the workplace. Despite the capacity of algorithms to optimise data processing, it is crucial not to overlook roles typically performed by humans. While most workers resist the idea of being managed by a machine, their acceptance may increase if they are assured that a human ultimately retains control.⁵⁰ But this begs the question: which human and whose interest does said human promote? Could there be an enhanced role for trade unions in enterprises where the ideal of human-in-command operates?

Forward-thinking policies have a pivotal role in steering the assimilation of digitalisation into the workplace. Their emphasis should not be solely on the feasibility of digitalising specific business functions, but also on promoting the socially necessary technological progress in which the fruits of innovation are distributed fairly among all stakeholders in society. Moreover, it is necessary to establish quality education and skills development programmes. Policymakers can facilitate funding and investment in lifelong learning and upskilling initiatives to equip workers with the capabilities needed to navigate the changing nature of work relations. At the heart of this is the requirement for an inclusive and participatory approach to policymaking. Collaboration with a diverse array of stakeholders, including workers, unions, employers

and tech experts, is vital in formulating policies for the common good.

Indeed, addressing the challenges of the rise of algorithms and digitalisation for workers requires an agile, multidimensional and coordinated strategy. Balancing labour and human rights with technological efficiency is paramount. Therefore, the precondition for success includes inclusive policies, continual review of legislation, and vigilance to safeguard the principles of democracy and workers’ dignity in the face of technological advancements. When properly regulated and implemented with the interests of workers in mind, technology can present opportunities to enhance working conditions and worker empowerment. Efforts to reform for the well-being of workers necessitate acknowledging that current policy and institutional frameworks have significant limitations in overcoming the socio-technical challenges of digitalisation. Re-evaluating and broadening these institutions, fostering proactive engagement with technology, and empowering workers through collective bargaining are critical steps to grapple with the ever-evolving structure of work.

WORKERS' AGENCY, PARTICIPATION AND CO-DETERMINATION

WORKERS' AGENCY, PARTICIPATION AND CO-DETERMINATION



With the encroachment of Algorithmic Management on business operations, the Nordic model's middle management structure, non-hierarchical work culture, and consultative orientation are being tested.



As algorithms increasingly influence management practices and work relations, and algorithmic architectures become de facto management architectures, the well-regarded humane models of capital-labour relations, notably the social-democratic “Nordic model” of work organisation⁵¹ and, to a lesser extent, the “European social model”, are facing new challenges. Tripartite cooperation is a classic trait of the Nordic model, in which strong trade unions, centralised employer organisations and legitimate governmental authorities collaborate to observe policy coordination in macroeconomic governance, public welfare services and organised working life.⁵² A key feature of this model of small, open economies in northern Europe is “co-determination”, which is closely tied to broader themes of worker agency and participation, but implies a certain degree of real influence on one’s working conditions and organisation of work. Co-determination is more than mere participation; it presupposes a degree of power to actually shape and influence management decisions. It is underpinned by a consensus-oriented ideology and a co-creation process, where listening to workers’ ideas and demands is associated with better outcomes, productivity and efficiency for the company or organisation as a whole. In other words, co-determination institutionalises conflict and results in sharing of the power to manage and direct between representatives of labour and capital,

thereby leading to consensus and resolving the inherent conflict between their interests. However, this system has been under increasing pressure, even in Nordic countries, due in part to processes such as globalisation and digitalisation.⁵³ Given the developments in AI and AM, the argument for strengthening these institutions is now more compelling than ever.

Co-determination is a distinctive process of workplace governance, where employees have a permanent role in participating and making decisions within an organisation, often alongside management and other stakeholders. It spans from consultation processes to extensive forms of employee representation on company boards or committees that decide on strategic business and labour-related matters. It is commonly associated with practices in trust-based societies of the Nordic countries and other parts of industrial Europe that have historically established collective bargaining institutions and labour peace during contractual periods. The underlying principle is that employees are organically represented and involved in decision-making bodies and processes that affect their working environment and conditions.

With the encroachment of AM on business operations, the Nordic model’s middle management structure, non-hierarchical work culture, and

consultative orientation are being tested. This behoves a re-examination of how these established institutional arrangements, which have been relatively successful, can be sustained or adapted to the varied demands and tendencies of digitalisation. The adoption of AM might contribute to increased inequalities, diminishing the long-held fair process of co-determination between employers and employees. Despite being a pioneer in progressive labour policies, the Nordic model now grapples with the potential negative impacts of algorithmic systems on workers' rights. The key question arises: can the Nordic model effectively adapt to the proliferation of AM in the digital economy without compromising its core principles? And could it serve as a policy inspiration for other countries and across legal and regulatory regimes? The installation and diffusion of new digital technologies can lead to an explosion of total factor productivity, particularly in technology-based Scandinavian and European economies. But how can the Nordic model sustain and improve its other invaluable pillars: high wage regime; welfare state; and work-life balance?

A case study of Sweden's commerce sector, specifically retail sales and warehouses, narrates the prevalence of employee monitoring. The monitoring systems operate in real time through a range of surveillance technologies, from CCTV and time clocks to physical exit controls, digital logging, individual sales performance monitoring, mystery shoppers, pre-employment checks, alcohol and drug testing, and GPS monitoring. The misuse of these monitoring systems, particularly real-time surveillance, resulting from a lack of transparency and employee consent, has had negative effects on employees' personal privacy, workload, health, commitment and social contact with co-workers. This intrusive mechanism, which makes work more direct and less varied, also undermines trust between management and employees. Although there are established rules and injunctions on workplace monitoring (e.g., the requirement for employers to clearly disclose the types of data collected and its purpose), it is apparent that employees are not deeply involved in the introduction or trade union negotiations of these monitoring systems and control measures.⁵⁴

Other recent research reveals an increasing use of digitalisation, including AM software, in Norwegian workplaces, for worker monitoring and surveillance, which are consequently used in workplace investigations. An analysis of 22 cases within standard employment relationships suggests that these AM-powered inquiries, often stemming from internal whistleblowing to address employee misconduct and breaches of company policies, tend to escalate conflicts, negatively affecting whistleblowers and dissenting voices. Instead of being handled through established co-determination forums, which have traditionally facilitated conflict resolution in the workplace with the help of trade union representatives, conflicts are increasingly *individualised* and *juridified* (i.e., processes amplified by digital technologies), treated as personnel issues, and channelled through digital whistleblowing channels. This occurs even when the issues raised pertain to conflicts around work organisation, performance measurement, evolution and other matters of collective interest. Such a mechanism limits and threatens the Nordic style of co-determination, whereby workers have representation and disputes are resolved collectively. The shortcomings of workplace investigations, which increasingly coincide with AM, are not solely due to procedural errors but are inherent in an inquisitorial process, where the employer funds, initiates and acts as investigator, prosecutor and judge.⁵⁵ This technical dynamic in regulatory and surveillance capitalism – where compliance-focused environments are inclined to criminalise behaviour – resonates beyond Norway's borders.⁵⁶

AM methodologies are instructive of the propensity of digital platforms to accelerate the erosion of the Nordic organisational framework of co-determination and the principles of workplace justice and democracy. This is particularly evident when these platforms are programmed in other jurisdictions (often in the USA) without considering established Nordic agreements or legal protections, thus sidelining co-determination apparatuses almost by default. Active intervention by trade union representatives is required to override this default setting. There have been both successes and failures in this regard. For instance, in the



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banking sector, Norwegian unions have been able to negotiate to a far greater degree than unions in the UK regarding the conditions of digital monitoring, control and surveillance of workers, demonstrating significant “country effects”.⁵⁷ Comparative research from Denmark, Germany, Hungary and Spain has also pointed to the need for stronger participatory institutions and collective agreements in the introduction and use of AM. Inspiring lessons can be drawn from success stories in countries like Denmark.⁵⁸ The potential of the Nordic model, even if not perfect and under pressure, could serve as a role model for other countries. It underscores why it is worth strengthening this model and adapting it in new ways in relation to the digital age.

Depending on its implementation and incorporation into organisational decision-making, AM can yield both positive and negative effects on co-determination. As AI-based algorithms are gradually used for employee monitoring and management automation, some studies have shown how worker representatives leverage traditional collective voice systems to oversee the adoption of these tools. Take, for example, a comparative study of two telecom companies in Germany and Norway, which examines the responses of unions and works council to AM in their contact centres. Both cases illuminate how worker representatives use these collective voice systems to protect worker privacy, autonomy and discretion against remote monitoring and workforce management technologies. Their strategies are shaped by varying institutional and countervailing powers of workers, including co-determination rights, data protection laws enforcement and labour collaboration structures.⁵⁹

Beyond the advanced Nordic and European economies, prospects for labour empowerment in a digitalising world economy are less favourable in countries and firms without a history and institution of co-determination. The application of AM methods would worsen power imbalances in the employment relationship, as workers often struggle to comprehend the technical aspects of this technology. The absence of membership of trade unions and labour confederations, which could articulate their interests, coupled with a limited understanding of the inner workings of algorithmic systems, restricts most workers’ ability to fully engage in discussions about their aspirations for the digitalisation of work processes and outcomes. However, this knowledge gap is not confined to workers; it extends to managers and purchasing departments. These managerial groups, who wield considerable influence over the introduction of new technologies, are sometimes swayed by exaggerated commercial promises due to a lack of critical understanding of data and its limitations. Moreover, the AM system can pose a health and occupational safety hazard, pressuring workers to become obsessed with productivity to meet algorithmically defined targets, leading to unreasonable work rhythms, stress, psychosocial risks and injuries.⁶⁰ These tangible issues signify the need for co-determination, which is not only an abstract theoretical concept, but a practical paradigm that empowers workers to shape the technological structure governing their work and take control of their working lives.

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Democratising Algorithmic Management practices and the digitalisation process may mean advancing the individual worker's right to “digital self-determination” and the collective workers' right to “digital co-determination”.

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There is a case to be made for the necessity and viability of legislating or institutionalising co-determination to cultivate synergy between workers, technology and employers. While digitalisation brings consequential challenges for labour power, it also opens up new possibilities for workers to exert their agency and contribute to the innovation process. To seize this opportunity, government decisionmakers and pro-labour groups must acknowledge that co-determination hinges on the presence and strength of workers' unions as the collective voice of their interests. It also depends on the reinforcement of the collective rights of workers and the upgrading of collective agreements for new digital realities.⁶¹ In this context, policy advocacy and political action are not mere adjuncts but essential components to create a level playing field for workers to effectively engage with and leverage evolving technologies.

Democratising AM practices and the digitalisation process may mean advancing the individual worker's right to “digital self-determination” and the collective workers' right to “digital co-determination”.⁶² In essence, co-determination is not merely a passive remedy to problems entailing the ways and means of AM, but rather a proactive approach of and by workers as value creators and innovators. It regards and foresees workers becoming architects of the future workplace, actively participating in building a social innovation system, rather than being passively subjected to top-down technological shifts.⁶³ As we traverse the complex terrain of technology integration, co-determination emerges as a beacon, illuminating the digital pathway where workers are not just beneficiaries but active contributors to the evolving world of work.



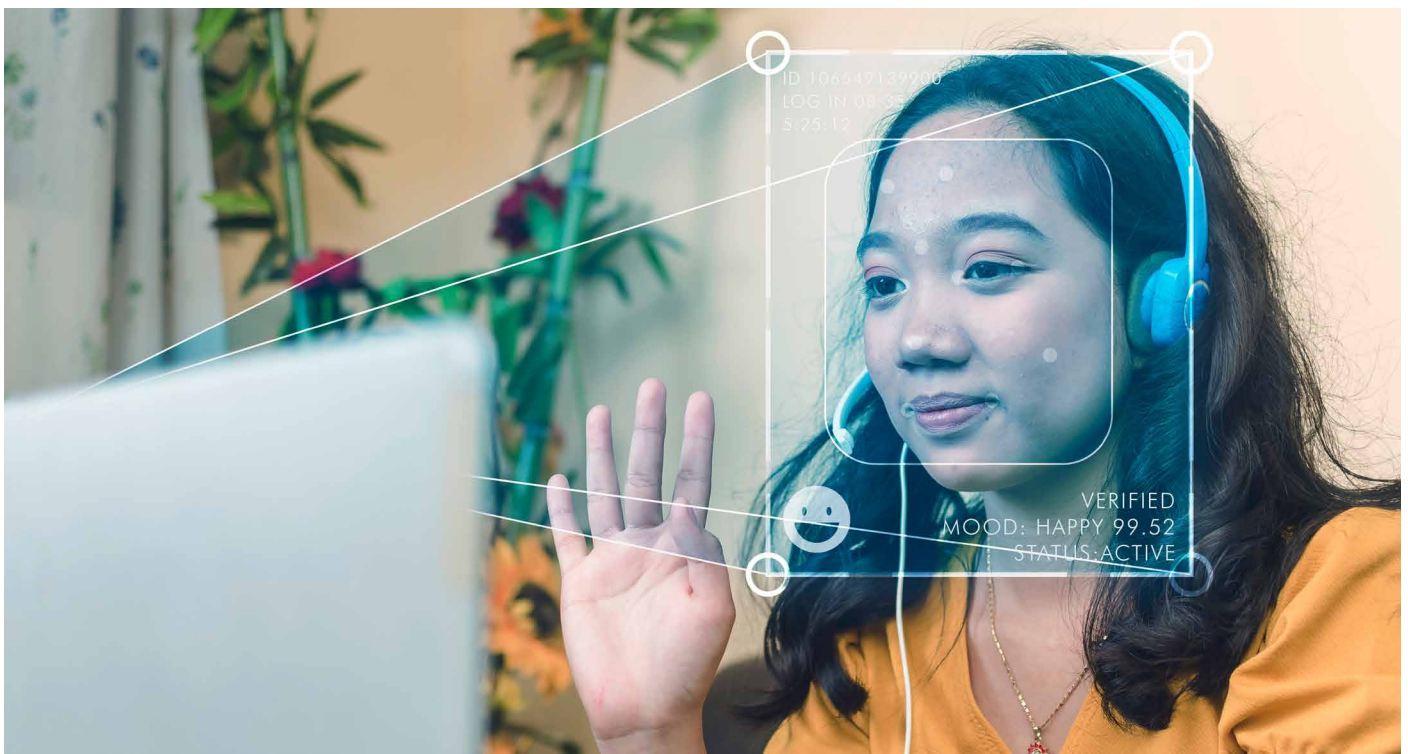
**CONCLUSION: ON
THE IMPORTANCE OF
CONTEXT-SPECIFIC,
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CONCLUSION: ON THE IMPORTANCE OF CONTEXT-SPECIFIC, PROBLEM-BASED AND MISSION-ORIENTED RESEARCH

At this historic juncture, competitive capitalism is becoming more globalised through digitalisation, engendering a complex interplay between technology and work. This necessitates further study and forecasting of the immediate and future impacts of new business techniques, such as AM, on workers' welfare and rights. Current regulations and institutions are proving insufficient at effectively addressing the risks and problems of the digital economy. Even in developed countries with strong labour unions and a tradition of co-determination, the harm experienced and perceived threats of

AM systems in the workplace are undermining the opportunities for worker empowerment.

AM is a new organisational and corporate practice of digital and surveillance capitalism. While it is undeniable that AM affects workers and businesses in various ways, the fundamental contradiction in capitalism's socio-technological structure persists. Specifically, it is capital – not labour – that is set free from the dynamic and evolutionary phenomenon of a digitalised mode of capitalist production. Given this, research into the impacts of AM on workers should be context specific, problem based and



Source: Photo by MDV Edwards from Shutterstock



The rise of the gig economy and platform work has accelerated the adoption of Algorithmic Management, enabling swift coordination and deployment of a decentralised workforce. These algorithms often prioritise efficiency, productivity and cost-effectiveness, transcending organisational boundaries as well as jurisdictions, and challenging traditional hierarchies.



mission oriented. A progressive research project should consider critical questions such as “Which issue area is the focus of research?”, “What problem does it address?”, and “Why and for whom is it significant?” Researching the implications of AM for workers’ rights can help in identifying the gaps in the current regulatory frameworks and providing evidence-based recommendations for improving the design, implementation and governance of AM systems. For example, research can inform the development of ethical principles and guidelines, social contract and legal standards, and participatory mechanisms that respect and advance labour rights and interests. More importantly, research can also seek to find answers to provide guidance to policymakers, trade unions, company managers, technology engineers and data scientists on how algorithms can be created and programmed by and for workers towards a fair, democratic and humane digitalisation of the workplace.

Together with digitalisation and related innovations that are reshaping the labour market, the AM phenomenon has garnered significant attention from academic scholars, government policymakers and business practitioners alike. Algorithmic management needs to be dissected in diverse sectors and contexts, identifying both commonalities and differences across industries, from high tech-based and industrialised economies in the Global North to emerging markets in the Global South.⁶⁴ Yet, AM needs to be dissected in diverse sectors and contexts, identifying both commonalities and

differences across industries, from high tech-based and industrialised economies in the Global North to emerging markets in the Global South. In doing so, it may reveal uncharted territories that demand further research investigation. It appears that AM shares core characteristics from sector to sector that influence the ways work is organised, monitored and evaluated – algorithms have become instrumental in allocating tasks, optimising schedules, determining performance indicators, and influencing the life chances and social status of workers, while reshaping professions, professional judgement, discretion and autonomy, as well as the very content of work.

Recent discourses and literature on AM and workers’ rights can be divided into three strands. The first strand describes and analyses AM practices and systems in different sectors and industries – initially in the gig economy and call centres, and more recently for warehouses and factories.⁶⁵ These studies provide some empirical evidence and examples for how algorithms are used to allocate tasks, set wages and evaluate performance, as well as to monitor behaviour, discipline and reward the workers. The benefits and challenges of AM are also explored and discussed, noting its impacts and consequences, such as increased efficiency, flexibility, autonomy, transparency, objectivity, exploitation, surveillance, control, stress and discrimination.

The second strand of publications and debates focuses on the policy and regulatory responses to AM,

and most especially the broader development of AI, at national, regional and international levels. These discussions include assessments on the adequacy and effectiveness of current regulations, reflecting on gaps and dilemmas. Guidelines, strategies and recommendations – such as a multi-stakeholder approach to formulating and implementing comprehensive, cohesive and cooperative policies – are also proposed to reap the benefits of and manage the risks of disruptive technologies for the economy, society and workers.⁶⁶

The third strand offers an evaluation and critique of AM from a normative and ethical stance, particularly from the perspective of human rights, social justice, labour struggle and democracy. Active proponents of such studies include socialist and social-democratic trade unions, parties, think tanks and political foundations. Their discourse questions AM's legitimacy and accountability, highlighting its potential harms and risks – notably, the dehumanisation, loss of voice, lack of representation, and violation of the privacy and dignity of workers.⁶⁷ Accompanying the problem analyses and criticisms in these expositions are proposals for the ethical design and responsible use of AM, including principles of human-in-command, non-discrimination, fairness and explainable AI. Related to this are arguments about the role and agency of workers within, or against, capitalist-led digitalisation.⁶⁸

There are commonalities in the prevailing literature about the concept and definition of AM, which has multiple dimensions, yet is commonly characterised by the use of data-driven algorithms with a view to optimising tasks and rationalising decisions. Nonetheless, it is equally, if not more, important to recognise points of difference between them. These differences stem from the level of analysis, choice of methodology and value-laden interpretations.⁶⁹

Researchers have identified commonalities in the application of AM across industries, especially the coordination of geographically diverse workforce in the global economy. Concurrently, AM exhibits industry- or sector-specific manifestations in particular country contexts with respective

ramifications for the labour structure.⁷⁰ Regulatory frameworks surrounding demands for transparency, problems of bias, performance metrics and the protection of workers' rights have emerged as critical discourses, underscoring the importance of ethical considerations.⁷¹

But, while AM's operational logic holds common threads, it also takes on distinct forms tailored to the unique demands of different industries. From ridesharing platforms to e-commerce warehouses, the application of algorithms varies based on the nature of labour and the specific goals of each sector. Contextual factors, such as the type of work, task complexity and skill sets required, introduce nuances that shape algorithmic implementation.⁷² These contextual differences can lead to varying impacts on workers' experiences, autonomy and performance, suggesting the need for industry-specific investigations. Surveying the published literature on AM necessitates a nuanced examination of its commonalities, differences and the gaps that beckon broader inquiry. As organisations integrate algorithms into their management practices and corporate strategies, it is imperative to consider the complexities of AM, while preserving workers' rights and fostering sustainable work environments for humans to flourish.

The everyday experiences of workers and long-term impacts of AM on their well-being warrant further research. AM in the workplace is a relatively new and multidimensional phenomenon. A comprehensive survey of its current applications and real-world examples is foundational for both research-based policymaking and academic theorising. At the same time, it is important to consider the potential effects of prolonged worker exposure to AM practices on their overall quality of life. Investigating these aspects could offer valuable insights for policy reforms and organisational strategising to mitigate any negative effects and promote worker well-being in algorithmically managed environments.

Furthermore, there is an urgent need for a study that looks into the question of institution building to regulate AM and other phenomena related to workplace digitalisation. Such research should



Governments, in alliance with trade unions and civil society, can change the playing field. Historically, successful technological revolutions have required activist states and appropriate socio-institutional frameworks to give a progressive direction to a new technology.



recognise the necessity and plausibility of embedding the techno-economy in society. With its internal dynamism and synergistic effects on the techno-economic and social spheres, the power of digital technologies – from the Internet of things and AI to blockchain technology and big data analytics – can be harnessed to innovate for the well-being of workers. So far, however, the Big Tech oligopolies have captured the digital revolution in ways that risk and undermine the dignity of human beings.

Governments, in alliance with trade unions and civil society, can change the playing field. Historically, successful technological revolutions have required the role of activist states and appropriate socio-institutional frameworks to give a progressive direction to a new technology.⁷³ Institutions and regulations are needed to direct innovations and investments, as well as production systems and consumption behaviour, to the pro-labour digital transition and its twin, the green transition.

Taking stock of the environmental costs, greenhouse gas emissions, biodiversity footprint, and water and energy usage connected to large data infrastructures, cloud computing and AI expansion needs to become part of the agenda of policymakers and the trade union movement.⁷⁴ Progressive action plans for labour should also prioritise the emerging discourse on environmental, social and governance reporting on AI; the institutional support needed at the turning point of the information and communication technology paradigm; and the regulation of data use.⁷⁵ Reporting in itself may not be able to effect the necessary change or guarantee compliance with

labour laws, collective agreements, data protection and privacy regulations.

A global institution, which could bolster the enforcement and coordination of national policies and regional regulatory agencies, should be established to govern and offset both the known and unknown risks of digital technologies. To this end, more research is required to comprehend the “transnational migration of state laws and policies”; the “normativity” generated within corporate, social and discursive networks; and the “strategies” of exploitation, resistance and regulation at the workplace level. It is also crucial to understand the dynamic interplay between these elements and their relationship to developments in “nonlabour policy domains” and the broader “global political economy”.⁷⁶ Despite the call for such research being made over a decade ago, much of this understanding remains elusive. The FEPS Digital Programme, with its comparative focus across Nordic countries, combining reality-based and policy-relevant analyses with interdisciplinary social scientific research, is uniquely positioned to bridge this knowledge gap. It can shed light on the actual practices in Nordic workplaces and to generate valuable insights into both existing and prospective translations of practical policies across borders.

A progressive research project like this ongoing study endeavour of the FEPS Digital Programme with its Nordic-based partners must indeed be attentive to realities in industry-specific contexts, social facts on the ground, feasible solutions to problems that any technology may entail, and the mission to defend and promote the inalienable rights and human dignity of

workers. The dynamics of capitalist competition not only generates constant technological innovations and greater division of labour, but also entails the process of proletarianisation, where flexible, mobile, fluid and disposable workers are completely subsumed under capital.⁷⁷ In the final analysis, a fundamental question for policy reflection, as well as for human relations themselves, in the digital age is not simply about the economic and business impacts of new technologies and algorithmic techniques in management, but more on the consequences of this contemporary configuration of capitalism for the present and future well-being of workers.



Source: Photo by Patrick Perkins from Unsplash

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Driven by the logic of competition in global capitalism, digitalisation is revolutionising the workplace, introducing both opportunities and challenges. This policy study reflects on the complex interplay between technology and work, focusing on the impacts of algorithmic management (AM) techniques on workers' rights, dignity and well-being. Drawing on preliminary findings from an ongoing study of FEPS in collaboration with Nordic-based partners, the policy study highlights the complexities and contradictions of AM and the limitations of current policies and institutions in dealing with the fast-paced digital transformation. It emphasises the importance of worker agency and participation in the innovation process. It proposes the need to create socio-institutional frameworks to direct a pro-labour digital transition and institutionalise co-determination as a viable solution for workers to engage actively with incessant technical changes. It concludes with a forward-looking perspective, advocating for research methodologies and problem-solving approaches that cater to the needs of diverse working contexts. The purpose is to contribute to informed policymaking that ensures a fair, democratic and humane work environment in the digital age.

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