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Platform workers: issues with qualifications and new opportunities of protection

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INTRODUCTION

The digitalisation of the economy and the progressive diffusion of artificial intelligence (AI) within productive and organisational processes represent one of the most profound and pervasive transformations of the twenty-first century, as they significantly affect the ways in which individuals work, produce, and interact, generating a structural change in employment dynamics, business models, and legal relations within the world of work.

In particular, the growing interaction between human beings and automated systems of decision-making and control, far from merely modifying the tools of work, tends to redefine traditional legal categories such as subordination, autonomy, employer, and worker, thereby posing new challenges in terms of the protection of fundamental rights, occupational health and safety, and organisational justice.

Within this framework, the phenomenon of *algorithmic management* emerges as one of the most innovative and, at the same time, one of the most problematic aspects of digital transformation. It is grounded in the use of automated systems and artificial intelligence for the allocation and distribution of tasks, the assessment of performance, behavioural monitoring, and the determination of working conditions. Through the extensive processing of big data and the predictive capabilities of algorithms, digital platforms and technologically advanced enterprises have developed new forms of algorithmic control, which are often opaque and difficult for workers to comprehend or contest.

Digital labour platforms, indeed, constitute the most evident paradigm of this evolution, as they rely on a model of technological intermediation that connects labour demand and supply through a digital infrastructure, fostering the emergence of a triangular relationship among the worker, the client, and the platform. Such a structure, though apparently neutral, conceals a peculiar form of economic and technological subordination, which manifests itself through mechanisms of rating, reputation systems, geo-location, and predictive performance analysis.

In this context, workers often find themselves subject to *algorithmic subordination*, deprived of any human interlocutor and exposed to automated decisions that affect the continuity of their employment relationship, their remuneration, performance evaluations, and even their future access to work opportunities.

Over recent years, these dynamics have raised a series of pressing questions for contemporary labour law, particularly regarding the guarantees of transparency and accountability in automated decision-making, as well as the reconciliation of technological innovation with the

protection of workers' dignity, health, and safety. They also bring into focus the role that European and national institutions can play in regulating a phenomenon that transcends traditional legal boundaries.

Within this complex framework, the protection of occupational health and safety (OHS) has acquired a renewed and interdisciplinary dimension. Algorithmic management and the automation of work processes generate emerging risks of a physical, psychological, social, and ethical nature, including hyper-connectivity stress, anxiety from continuous evaluation, loss of decision-making autonomy, social isolation, and algorithmic discrimination.

Such risks, in essence, require an updating of traditional risk-assessment and management tools through an integrated, risk-based approach grounded in the principles of worker participation, continuous training, and effective human oversight.

With regard to these issues, a series of regulatory responses have been developed at both supranational and national levels. At the supranational level, the *General Data Protection Regulation* (EU) 2016/679 (*GDPR*) represented a significant milestone in recognising rights to transparency, explainability, and human supervision in automated decision-making processes. However, it was only with the adoption of Regulation (EU) 2024/1689 (the *AI Act*) that the European Union established a comprehensive framework for the regulation of high-risk AI systems, explicitly including those deployed in employment and human-resources management contexts.

The *AI Act* has had the merit of introducing requirements relating to risk assessment, traceability, documentation, and human oversight, while recognising that algorithmic management can profoundly affect fundamental rights such as non-discrimination, privacy, professional freedom, and occupational health and safety.

In the same vein, the *Directive (EU) on improving working conditions in digital platform work*, adopted in 2024, enshrines an essential principle: digital technologies and algorithmic systems must neither replace human judgement nor be used as instruments to circumvent the guarantees enshrined in labour law. The Directive, in particular, introduces, on the one hand, a presumption of employment status in favour of platform workers and, on the other, imposes specific informational obligations concerning the functioning of automated systems, together with enhanced safeguards in matters of health, safety, and organisational well-being. It thus represents a fundamental milestone in the development of a human-centred regulatory framework for digitalisation, consistent with the principles of the *European Pillar of Social Rights*, which recognises the right to fair, safe, and dignified working conditions.

Despite these advances, a significant degree of regulatory fragmentation persists across Member States, both in terms of the legal classification of platform workers and the scope of occupational health and safety protections afforded to them.

In this respect, Italy, Spain, and the United Kingdom, which form the focus of the comparative analysis undertaken in this thesis, illustrate three emblematic regulatory models addressing the governance of the gig economy and algorithmic management of work.

In the Spanish context, the *Ley de los Riders* (Law No. 12/2021) introduced a statutory presumption of employment for platform-based delivery workers, imposing, in relation to health and safety, obligations of transparency upon enterprises regarding algorithmic systems, to the benefit of workers and their representatives.

In Italy, by contrast, the legislature has recognised the applicability of the legal framework governing subordinate employment to *riders* and hetero-organised collaborators under article 2 (para. 1) of Legislative Decree No. 81/2015, thereby extending to them the protections in health and safety laid down in Legislative Decree No. 81/2008. Furthermore, a minimum set of protections has been granted to self-employed *riders* under article 47-*bis* of the same Decree, including those concerning health and safety (article 47-*septies*(3)). The right to information and consultation on automated systems, as well as the right to transparency and human oversight, has also been extended to these workers and their representatives pursuant to article 1-*bis* of Legislative Decree No. 152/1997 (as introduced by Legislative Decree No. 104/2022).

In the United Kingdom, meanwhile, the case law, most notably in *Uber BV v Aslam*, has recognised the "*worker*" status of platform collaborators. From the health and safety perspective, particular emphasis has been placed on the need to reconcile flexibility with protection, through both existing legal provisions and the forthcoming *Artificial Intelligence Bill 2024*, which is expected to provide valuable insights into the effective safeguarding of occupational health and safety in AI-mediated environments.

Against this background, the principal research questions of the present study may be formulated as follows: How does the diffusion of artificial intelligence within the workplace affect the structure of managerial power and the configuration of workers' fundamental rights? What specific health and safety risks emerge from new models of algorithmic management? In what manner do the *AI Act*, the *GDPR*, and the *Directive on Platform Work* contribute to constructing an integrated framework capable of addressing the numerous risks, particularly psychosocial ones, faced by platform workers? What lessons can be drawn from comparative law, specifically from Italy, Spain, and the United Kingdom, regarding

transparency, supervision, and trade union participation in the use of AI, as effective instruments for safeguarding workers' health and safety? Finally, is it possible to devise an ethically grounded and sustainable governance model for artificial intelligence that harmonises technological innovation, social justice, and organisational well-being? In light of these questions, this thesis aims to conduct a systematic and interdisciplinary analysis of the interaction between artificial intelligence, algorithmic management, and the protection of occupational health and safety in digital platform work. The objective is not merely descriptive; rather, it seeks to identify the principles, recommendations, regulatory instruments, and governance models capable of enabling technological innovations to adapt to human beings, rather than the reverse, thereby eliminating risks to workers or, at the very least, managing them according to a preventive approach. To achieve this objective, the research adopts a comparative and interdisciplinary (in particular, from a socio-economic, philosophical, and technological perspective) methodological approach, focusing on Italy, Spain, and the United Kingdom, in order to discern both the convergences and divergences among their respective legal frameworks in addressing the impact of AI and algorithmic management on work and health and safety in digital labour platforms. Comparative legal analysis, far from serving a purely descriptive purpose, is thus employed as a critical instrument of interpretation and evaluation, aimed at identifying solutions that are more sustainable from a social perspective and, consequently, more effective in terms of safeguarding workers. Such a comparative perspective allows for an assessment of the effectiveness of health, safety, and fundamental rights protections within algorithmically mediated work environments, while also identifying existing gaps, best practices, and potential trajectories of normative convergence.

The purpose of this endeavour is therefore not solely analytical, but also propositional: to outline, in the light of comparative experience, a European and international regulatory model capable of reconciling technological progress with human centrality and the social sustainability of digital labour.

In view of the foregoing, the thesis is structured into six chapters, each addressing a distinct level of analysis, following a progressive trajectory that moves from the conceptual and historical definition of artificial intelligence to the formulation of a global governance proposal for platform work.

The first chapter introduces the theoretical and technological framework within which the research is situated, tracing the evolution of the concept of artificial intelligence from its origins to its most recent applications in systems of production and work management,

including those related to digital labour platforms. Particular attention will be devoted to the relationship between technological innovation, robotics and big data, highlighting both the potential and the emerging risks to occupational health and safety, as well as the ethical and social challenges associated with the use of AI, with reference to the principles of fairness, transparency and human oversight.

In doing so, the chapter lays the groundwork for a critical reflection on the sustainability of such technologies.

The second chapter focuses on the regulatory framework of the European Union, with particular emphasis on how EU legislation addresses the impact of AI on the health and safety of platform workers. In this regard, it will examine Regulation (EU) 2024/1689 on Artificial Intelligence (the *AI Act*), the *Directive on improving working conditions in platform work*, in conjunction with the *GDPR* and the protections derived from Directive 89/391/EEC. The discussion will also touch upon issues concerning algorithmic management, human oversight obligations, the *risk-based approach*, and the role of *impact assessment* (DPIA) as a preventive safeguard instrument.

The third chapter explores the legal classification of platform work in Italy, Spain and the United Kingdom through a comparative analysis of the relevant jurisprudential and legislative developments. It investigates the relationship between autonomy and subordination, the difficulties faced by traditional labour law in adapting to new digital organisational models, and the divergent regulatory responses in the three legal systems, including the relevant case law of the Court of Justice of the European Union.

The fourth chapter examines the impact of artificial intelligence on platform work, analysing how algorithmic management is transforming modes of work organisation and highlighting the implications in terms of well-being, psychosocial risks, digital surveillance and automated discrimination. The analysis will further focus on the role of transparency, explainability and trust in AI systems as key determinants of the sustainability of digital labour.

The fifth chapter provides an in-depth comparative assessment between Italy, Spain and the United Kingdom, focusing on the regulation of transparency and occupational health and safety in platform work. It will examine Directive (EU) 2019/1152, the AI Act and the Directive on improving working conditions in platform work, shedding light on both the convergences and divergences between the three systems, with particular attention to mechanisms of worker consultation, informational obligations, and the role of trade unions in algorithmic governance.

Lastly, the sixth chapter, acknowledging the partial limitations of the existing regulatory tools, broadens the perspective to the international level by analysing public and private instruments aimed at promoting global protection of health and safety in platform work. Particular attention will be given to the role of the *International Labour Organization* (ILO), ISO standards on risk and AI impact management, and collective participation and training policies as strategic levers for ensuring a fair and sustainable digital transition. The chapter will also consider recent international regulatory initiatives designed to provide increasingly effective safeguards for platform workers.

It concludes with a reflection on the possible development of a *Universal Charter of Digital Workers' Rights*, reaffirming the centrality of the human person in the age of artificial intelligence[1].

The research, therefore, seeks to contribute to the definition of a sustainable and proactive model of regulation, capable of accompanying the digital transition in full respect of the principles of human-centredness, social justice and organisational well-being, in line with the European strategies for a fair, safe and inclusive future of work.

[1] In particular, it is highlighted that, in light of the persistent fragmentation of the EU regulatory framework governing digital work, especially with regard to smart working and platform work, soft law instruments and directives exhibit significant limitations in ensuring a uniform level of protection. In this context, therefore, the adoption of a Universal Charter, in the form of a European Regulation, is envisaged from a universalistic perspective, aimed at establishing a catalogue of minimum, non-derogable rights applicable to all digital workers, irrespective of the legal classification of the employment relationship. Among the protections considered essential are the right to fair remuneration, health and safety protection, collective rights, the portability of digital reputation, safeguards against algorithmic decision-making, and adequate income support mechanisms. In this perspective, see M. TUFO, "*Il lavoro digitale a distanza*", Editoriale Scientifica, Napoli, 2021, pp. 523-530; V. DE STEFANO, "*The rise of the "just-in-time workforce": on-demand work, crowdwork, and labor protection in the "gig-economy"*", in ILO, 2016, p. 500.

CHAPTER ONE

Introduction to the context of Artificial Intelligence and Digital Platform Work.

1. Introduction.

Starting from the 1980s, the advent of the personal computer introduced information technology into society, revolutionising industry, professions, and everyday life itself. Legal scholars, in particular, sought to address the new legal challenges arising from this development, such as data protection, software safeguarding, copyright, and computer-related crimes. At the same time, they began to use computers to draft documents and consult databases, both local and online.

In the 1990s, the Internet revolution enabled the connection of people and devices in a global network, transforming it into an inexhaustible source of information and an environment that allows interactions of every kind. In this way, the economic and social dimensions shifted into a sort of *infosphere*, that is, a physical-virtual ecosystem characterised by enormous quantities of digital data, processed and shared by interconnected machines.

Consequently, legal issues related to information technology gained greater significance, as they affected several contexts such as e-commerce, personal data protection, the liability of digital service providers, rights over digital content, and competition within virtual markets.

At the same time, the use of information technology also transformed the work of legal professionals, introducing tools such as electronic proceedings and the creation of digital documents.

In the current era, we are witnessing the third revolution, that of Artificial Intelligence (hereinafter AI), where activities that once required human intelligence can now be entrusted to machines capable of reasoning[2], learning, and acting[3].

Indeed, when discussing the reasoning abilities of AI, as one of the most authoritative voices in the field of AI[4] also argues, reference must be made to the learning methods of technological systems. While human beings develop mental frameworks capable of

[2] R. E. BELLMAN, "*An Introduction to Artificial Intelligence: Can Computer Think?*", Boyd e Fraser, 1978; T. FELIN, M. HOLWEG, "*Theory Is All You Need: AI, Human Cognition, and Causal Reasoning*", in Strategy Science, vol. 9, n. 4, 2024.

[3] G. SARTOR, "*L'intelligenza artificiale e il diritto*", Torino, Giappichelli, 2022, p. XI.

[4] M. MITCHELL, "*Seemingly 'sentient' AI needs a human in the loop*", The Financial Times, 2022.

understanding the world around them by analysing causes and effects and demonstrating remarkable adaptability when confronted with new situations, AI technological systems, by contrast, exhibit a wholly peculiar form of learning, as they tend to gather practical strategies aimed at the rapid resolution of the problems they are presented with. Therefore, instead of achieving genuine understanding of the world in the way a human would, AI boasts rather a highly sophisticated capacity for imitation; one need only consider applications such as ChatGPT, which learn to reproduce the mechanisms that characterise human reasoning without, however, thinking in the same way[5].

Furthermore, the experiments conducted by Keyon Vafa, a Harvard researcher and expert in artificial intelligence, clearly reveal the limitations encountered by AI: for instance, using the city of Manhattan as a testbed, it was found that AI systems, trained on millions of driving directions, were often capable of providing correct routes while "imagining" the city in a distorted way and suggesting impossible paths, such as crossing Central Park in a straight line.

This can be explained by the fact that AI, rather than understanding geography, focusing attention on the example at hand, merely constructs ad hoc rules for each origin and destination, thus revealing a strategy that privileges the appearance of a correct result rather than the logical process leading to that outcome. The same reasoning applies in the field of mathematics, where models, far from learning general rules, tend to memorise shortcuts for solving specific cases. It becomes clear, then, that although AI excels at recognising and combining mechanisms to achieve striking results, it struggles greatly to construct stable and flexible conceptual models, as even slight contextual changes are enough to disrupt the system's coherence[6].

Applications that were once considered highly sophisticated, such as speech recognition, automatic translation, and object recognition, are now accessible to anyone with a smartphone. Indeed, intelligent technologies are assuming an impressive range of functions, including the ability to make automated decisions, predict human behaviour, monitor workplaces and public spaces, perform biometric recognition, manage robots, and control autonomous vehicles.

These innovations raise new, and yet unresolved, legal questions.

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[5] L. MISCHITELLI, "*IA Generale. L'IA non pensa, imita: il grande equivoco della mente artificiale*", 2025, in L'IA non pensa, imita: il grande equivoco della mente artificiale - Agenda Digitale, pp. 4-6.

[6] K. VAFA et al., "*Evaluating the World Model Implicit in a Generative Model*", 2024, in 2f6a6317bada76b26a4f61bb70a7db59-Paper-Conference.pdf.

Moreover, the practice of law itself is destined to change profoundly; beyond expert systems that automatically apply formalised rules, new machine learning tools are emerging, capable of analysing vast amounts of data and developing predictive and decision-making models.

In this regard, when speaking of "decision-making" in the context of AI, it is essential to avoid conceptual misunderstandings, given that AI systems, lacking autonomous decision-making power in the legal sense, cannot therefore modify contractual relationships nor directly affect the legal sphere of workers. Any legal effect, in fact, always and necessarily requires the intervention of the employer, who remains the sole holder of managerial and organisational authority.

At most, AI systems may provide indications, suggestions, or probabilistic assessments, since the choice to accept or reject their output always lies with the employer, who performs the managerial act intended to produce effects within the employment relationship.

Moreover, the current regulatory framework does not permit any possibility of construing the machine as a delegate or proxy of the employer and, even if such an interpretation were hypothetically conceivable, it would not amount to relieving the employer of the legal responsibility inherently vested in them[7].

In essence, AI, far from replacing the employer, amplifies both their powers and their responsibilities[8]; conversely, entrusting AI with decision-making authority means, rather than recognising autonomy in the machine, obscuring the human origin of decisions, thereby creating a dangerous veil of de-responsibilisation[9].

The words of the chorus in Sophocles' *Antigone*, describing humankind as "capable of wonders and terrors", aptly capture the ambivalence with which AI is viewed today: on one hand, admiration for its potential; on the other, a certain apprehension about the risks associated with its development and use. The jurist cannot avoid questioning whether such technologies can be regulated by law to promote the common good, or whether, conversely, they will be subordinated to particular interests, potentially overwhelming existing institutions. It is also worth asking whether AI will be capable of improving the application of the law, making it more efficient and just, or whether, on the contrary, it will risk replacing

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[7] S. CIUCCIOVINO, "*La disciplina nazionale sulla utilizzazione dell'intelligenza artificiale nel rapporto di lavoro*", in LDE, 2024, n. 1, 5.

[8] G. TEUBNER, "*Soggetti giuridici digitali? Sullo stato privatistico degli agenti software autonomi*", Edizioni scientifiche italiane, 2019; M. FAIOLI, "*Mansioni e macchina intelligente*", Giappichelli, 2018; F. LONGOBUCCO, "*Utopia di un'autonoma Lex Criptographi(c)a e responsabilità del giurista*", Edizioni scientifiche italiane, 2023.

[9] A. SARTORI, "*L'impatto dell'intelligenza artificiale sul controllo e la valutazione della prestazione, e sull'esercizio del potere disciplinare*", in LDE, 2024, n. 3.

human activity with automated decision-making, relegating the jurist to a subordinate role to the machine[10].

Focusing on the world of work, it should be observed that the integration of digital technologies in workplaces is bringing about changes not only in the way work is performed but also in the location and timing of work itself. At the same time, there is a rethinking of the very future of work, leading to a reorganisation of job types and of the methods of delivery, organisation, and management of assigned tasks.

This transformation is undeniably essential, affecting the vast majority of productive sectors, as companies adopt technological tools capable of increasing productivity, for instance, through the automation of tasks or the algorithmic management of workers, both in traditional work environments and in the context of remote or home-based work.

Indeed, digitalisation presents significant opportunities for both workers and employers, but also entails numerous risks in terms of health and safety.

As for the former, automation allows machines to take over repetitive, strenuous, and hazardous tasks, while advanced technologies such as robotics and artificial intelligence can provide support and substitution in high-risk work environments. Innovative tools such as exoskeletons are also improving access to the labour market for disadvantaged groups, including people with disabilities, migrants, and those living in areas with limited employment opportunities.

Moreover, digital technologies enable more effective monitoring of working conditions, allowing for timely intervention through big data analysis; for example, 19.2% of European workers use devices to monitor environmental parameters such as noise, chemicals, dust, and gases, while 7.4% use tools to track vital data such as heart rate, blood pressure, and posture, thereby making workplaces safer and more controlled[11].

Remote work, made possible by digitalisation, also brings significant benefits. Such workers are less exposed to incidents of violence or verbal abuse compared to the overall workforce (7.9% versus 15.7%) and report a lower incidence of harassment or bullying (around 4.4% compared with 7.3%), since this type of work tends to reduce direct interactions with clients, patients, and colleagues, thus limiting potential conflicts.

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[10] G. SARTOR, "*L'intelligenza artificiale e il diritto*", *cit*., pp. XI-XII.

[11] EU-OSHA, "*OSH Pulse — Sicurezza e salute sul lavoro dopo la pandemia*", in OSH Pulse – Sicurezza e salute sul lavoro dopo la pandemia | Safety and health at work EU-OSHA 2022.

In addition, remote workers enjoy greater autonomy, with only 14.4% reporting a lack of control over work pace or processes, and they benefit from a better work–life balance, gaining flexibility and independence.

These transformations result not only in decisive improvements to working conditions but also in a redefinition of how workers and companies face the future, promoting inclusiveness, efficiency, and safety.

Conversely, the risks associated with the adoption of digital technologies in the workplace should not be underestimated, as highlighted by recent EU-OSHA reports based on in-depth analyses, statistical studies, and field research. Among the main concerns is digital monitoring, which can lead to a loss of autonomy for workers, intensifying workloads and generating constant pressure to maintain specific productivity levels.

In many cases[12], roles traditionally held by middle management are being replaced by algorithms that assign tasks to employees and evaluate their performance, thereby altering

[12] There are some examples where algorithms frequently replace human management: Consider, for instance, micro task platforms, where tasks are automatically made available to eligible workers through algorithms, on the basis of the ratings assigned to them (by means of the same algorithms) and other parameters, such as age, gender, or country of origin. Workers may also perform such tasks according to an allocation criterion based on the order of arrival (*first-come, first-served*). However, the design features of platforms may significantly affect access to work: platforms themselves, or their clients, may decide whether a particular task should be performed by a global pool of workers or by specific groups identified on the basis of certain characteristics, thereby restricting access to work opportunities for workers from certain countries. With regard to monitoring and control mechanisms on micro task platforms, it should be noted that these are generally entrusted to algorithms that verify whether the work has been performed in accordance with the required specifications. Some platforms also enable clients to assess the level of workers' attention by inserting control questions within the tasks. Where a worker provides an excessive number of incorrect responses, they may lose access to the task and the corresponding remuneration, with negative consequences also for their ratings. As for the evaluative role traditionally performed by management, this is, in the present context, often automated through predefined algorithmic systems that assess the work once it has been completed. Such systems, in fact, accept or reject tasks on the basis of predetermined criteria. For example, on certain platforms each individual task may be assigned to multiple workers simultaneously, and a comparison system among the responses allows those deemed correct to be identified; payment is made only if the task is accepted by the algorithm. Although some platforms allow limited forms of communication between workers and clients, in many cases such interaction is absent. This frequently generates frustration among workers, who do not receive explanations regarding the rejection of tasks and therefore have no opportunity to improve their performance or correct possible errors. Furthermore, the rejection of tasks negatively affects workers' ratings and reputation, thereby further compromising their future employment opportunities. See, in this regard, also U. RANI, M. FURRER, "*Digital Labor Platforms and New Forms of Flexible Work in Developing Countries: Algorithmic Management of Work and Workers*", in Competition & Change, 2021, vol. 25 (2), pp. 212-236. Further examples can be found in transport platforms, such as Uber, where navigation technologies, such as GPS systems, enable the continuous monitoring of workers' behaviour through the collection of data relating, for example, to driving speed, braking, acceleration, and the worker's precise geographical location. These tools also allow platforms to monitor the time taken to complete a delivery or a ride. The data collected in real time make it possible, for instance, to identify behaviours considered irregular or risky and, in certain cases, to automatically suggest that the worker temporarily suspend their activity or take a rest. In order to ensure compliance with rules and cooperative conduct towards clients and customers, platforms rely on disciplinary mechanisms primarily based on two instruments. On the one hand, they employ incentives and reward systems to shape workers' behaviour; on the other hand, they adopt punitive measures against those who deviate from the required standards, by restricting access to work opportunities or by temporarily or permanently suspending accounts. These dynamics are further reinforced by workers' awareness of the intense competition resulting from the oversupply of labour available on platforms, a factor that further

workplace dynamics. Such processes can lead to a loss of control by workers over their own activities, accompanied by a fragmentation of tasks into simple and standardised duties that significantly reduce both complexity and professional content. This, in turn, may cause progressive deskilling and increase worker isolation[13], fostering mainly virtual interactions and limiting mutual support among colleagues.

Another risk stems from automated or semi-automated decision-making, which may prove inaccurate or unfair due to potential errors in the data or software used.

This dynamic is often intertwined with systems of warnings, sanctions, and performance evaluations, which can heighten psychological pressure on workers.

Furthermore, the implementation of such technologies has raised issues concerning the clarity of responsibilities in the field of occupational health and safety and the effectiveness of the current regulatory framework, which may prove inadequate for addressing new digital scenarios. The growing demand for mobility and flexibility, combined with the continuous availability of workers, risks blurring the boundaries between professional and private life, creating additional pressures and undermining overall well-being.

These aspects, therefore, call for careful reflection to ensure that the use of digital technologies at work takes place in full respect of workers' health, safety and rights[14].

2. *The evolution of the concept of Artificial Intelligence: history, economic perspectives, and challenges for occupational health and safety.*

The concept of AI was introduced in 1956 during a series of academic seminars held at Dartmouth College, New Hampshire, United States, where a group of scientists, led by John McCarthy, set themselves the goal of teaching machines to use language, to formulate concepts, to improve autonomously and to solve problems traditionally addressed by human

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contributes to forms of self-disciplining aimed at ensuring continued access to work. In particular, within transport platforms such as Uber, drivers are frequently incentivised through bonus schemes, which are used not only to encourage their retention on the platform but also as indirect instruments of control and discipline. Such strategies may vary depending on the national context, local demand, and the presence of competitors. For example, financial incentives may be provided for completing a certain number of rides, for working during time slots characterised by high demand, or for being available to work during socially unsociable hours. See, in this regard, also N. SCHEIBER, "*How Uber uses psychological tricks to push its drivers' buttons*", in The New York Times, 2017; K. GRIESBACH et al., "*Algorithmic Control in Platform Food Delivery Work*", in Socius: Sociological Research for a Dynamic World, 2019, vol. 5, pp. 1–15. For a comprehensive analysis, see ILO, "*The Algorithmic Management of work and its implications in different contexts*", 2022, n. 9, pp. 13-16.

[13] Y W. LEI, "*Delivering solidarity: platform architecture and collective contention in China's platform economy*", in ASR, 2021, 86, pp. 279–309.

[14] M. CESIRA URZI' BRANCATI, "*Digital technologies at work and psycosocial risks: evidence and implications for occupational safety and health*", in EU-OSHA, 2024.

beings[15]. The organisers, in fact, were driven by the belief that such goals could be achieved within a few weeks and, although the conference did not deliver the expected results, it marked the beginning of an important line of research and development in the field of AI.

Taking a few steps back, it should be noted that the trajectory of this discipline has gone through alternating phases, oscillating between moments of great enthusiasm, during which it was hoped to create machines capable of achieving an intelligence similar to that of humans, and periods of disillusionment and stagnation, as occurred with the first robot prototypes, such as "*WOBOT*" and "*Shakey*", which failed to meet expectations of creating a universal AI, leading to two so-called "*AI winters*", respectively between 1974 and 1980 and between 1987 and 1993, characterised by a marked decline in interest and a reduction in funding following unsuccessful attempts.

Today, however, we are witnessing a new wave of enthusiasm, since, starting from 2019, the most advanced economies, such as those of the United States, China and Israel[16], have been investing heavily in AI development, with allocations amounting to billions of dollars.

Moreover, there are forecasts suggesting that AI could help increase China's GDP by 26% by 2030, while for North America an increase of 14.5% has been estimated, and there are also studies indicating that AI could both create and eliminate a considerable number of jobs, thereby balancing the effects on employment[17].

Equally noteworthy are the reports produced by governmental, regional and international institutions, which tend to emphasise the significant impact of AI on economies and societies; among these are the analyses of the White House in the United States[18], the British governmental departments for industry and digital affairs, the *International Labour Organization* (ILO)[19] and the European Commission[20], whose overall assessment lies in the prospect of increased productivity, as well as in reflections on working conditions and workers' rights.

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[15] J. McCARTHY et al., "*A proposal for the Dartmouth Summer Research Project on Artificial Intelligence*", in ResearchGate,1955.

[16] L. DELPONTE, "*European artificial intelligence leadership, the path for an integrated vision*", Bruxelles, Thematic Department on Economic and Scientific Policy and Quality of Life, European Parliament, 2018.

[17] J. BUGHIN et al, "*Notes from the AI frontier modeling the impact of AI on the world economy*", in Mckynsey&Company, 2018, pp. 31 ss; PWC, "*Artificial intelligence in HR: A no-brainer*", 2017, in artificial-intelligence-in-hr-a-no-brainer.pdf; PWC, "*AI will create as many jobs as it displaces by boosting economic growth*", 2018b, in FE News | AI will create as many jobs as it displaces by boosting economic growth.

[18] See the White House Office of Science and Technology Policy ,"*Summit on artificial intelligence for American industry*", 2018, in OCR of the Document | National Security Archive.

[19] E. ERNST, R. MEROLA, D. SAMAAN, "*The economics of artificial intelligence: Implications for the future of work*", *Future of Work Research Paper Series dell'OIL*, Ginevra, Organizzazione internazionale del lavoro, 2018.

[20] EUROPEAN COMMISSION, "*Comunicazione sull'intelligenza artificiale per l'Europa*", Bruxelles, 2018.

Despite the great interest in AI and its effects on the economy, there is still little attention (although steps have now begun to be taken) to the impact of such technologies on occupational health and safety.

2.1. Artificial Intelligence: definitions and contemporary challenges between innovation and human oversight.

The debate over what constitutes AI and what does not remains ongoing, and considering the significant governmental investments in research and development, as well as the forecasts concerning the economic impact of AI – such as its contribution to GDP and productivity – it becomes necessary not to underestimate the issue.

The "dilemma" regarding the authenticity of AI is entirely legitimate and, in order to avoid any ambiguity throughout this analysis, it is deemed appropriate to examine the origins of the debate so as to understand what is actually meant by artificial intelligence.

In this regard, John McCarthy and his colleagues, who introduced the term during the 1956 conference, described AI as the ability of a machine to behave in ways that would be considered intelligent if performed by human beings[21].

Such a definition, pioneering the very concept of AI, appears crucial, as it allows us to grasp current issues and to pose a fundamental question: is it truly possible to make machines behave like human beings? And, more importantly, why do we desire machines to be capable of imitating or even surpassing them?

These questions, which were originally at the heart of the reflection on AI, have certainly not lost their significance, as they involve philosophical and social themes related to the relationship between humans and technology.

In order to provide a practical framework for the discussion, it is necessary to consider a definition of AI proposed by the European Commission in 2018, according to which it "*refers to systems that display intelligent behaviour by analysing their environment and taking actions, with some degree of autonomy, to achieve specific goals*"[22].

Another definition, provided in the same year in the report *European Artificial Intelligence Leadership, the Path for an Integrated Vision*, conceives AI as a set of techniques based on

[21] J. McCARTHY et al., "*A proposal for the Dartmouth Summer Research Project on Artificial Intelligence*", *cit*. In particular, see also J. McCARTHY, "*What Is Artificial Intelligence*", rapp. tecn., Stanford University, 2007. Original text: *"[AI] is the science and engineering of making intelligent machines, especially intelli gent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable*".

[22] EUROPEAN COMMISSION, "*Comunicazione sull'intelligenza artificiale per l'Europa*", *cit*.

data analysis and pattern recognition; the peculiarity of such technologies lies, in fact, in their ability to learn from the environment and make autonomous decisions[23]. Despite these definitions, it must be noted that the concept of AI continues to raise many questions, particularly within the legal context. In this respect, if there is no shared notion of intelligence or no ability to determine precisely what can be considered "intelligent", it follows that it is impossible to distinguish between what may or may not be identified as an "intelligent" computer system, for the purpose of applying AI regulations exclusively to the former.

This issue has, in fact, gained greater concreteness through the *Proposal for an AI Regulation* (now the *AI Regulation*, it has been definitively approved) put forward by the European Commission.

In particular, article 3 attempts to describe an AI system as software developed using one or more techniques listed in Annex I, capable of generating outputs such as content, predictions, recommendations or decisions that influence the environment with which it interacts, with the purpose of achieving objectives defined by human beings.

Annex I draws a distinction between three main technologies that characterize AI, suitable for qualifying software as an "*AI system*", and which include machine learning approaches (such as supervised, unsupervised and reinforcement learning, including advanced methods like deep learning), logic- and knowledge-based approaches (for example, knowledge representation, knowledge bases and expert systems), and statistical approaches (including Bayesian estimation, search methods and optimization).

Another definition of AI was developed by the *High-Level Expert Group on AI* (AI HLEG), established by the European Commission, which described such systems as *software* (or even *hardware*) developed by human beings with the aim of operating in physical or digital environments, and which collect and interpret structured or unstructured data, reasoning on the information derived from such data and deciding on the best actions to undertake in order to achieve certain objectives, while also having the ability to adapt their behavior according to the effects of their previous actions[24]. Indeed, such a definition tends to highlight multiple

[23] L. DELPONTE, "*European artificial intelligence leadership, the path for an integrated vision*", *cit*., p. 11.

[24] AI-HLEG, *High-Level Expert Group on Artificial Intelligence*, "*A definition of AI: Main ca pabilities and scientific disciplines*", European Commission, 2019. The original text read as follow: "*Artificial intelligence (AI) systems are software (and possibly also hardware) systems designed by hu mans that, given a complex goal, act in the physical or digital dimension by perceiving their environment through data acquisition, interpreting the collected structured or unstructured data, reasoning on the knowledge, or processing the information, derived from this data and deciding the best action(s) to take to achieve the given goal. AI systems can either use symbolic rules or learn a numeric model, and they can also adapt their behaviour by analysing how the environment is affected by their previous actions*."

functions typical of AI, although it is important to recognize that most AI systems perform only a fraction of these activities.

By way of example, some systems are focused on specific single functions, such as *pattern* recognition (for instance, object classification, biometric recognition or emotion analysis), language translation, filtering of undesirable content (such as spam or violent material) or information selection (targeted advertising), while others, such as autonomous vehicles, combine multiple capabilities, as they include object recognition, route planning and self-management during travel.

The European Commission, moreover, in its characterization of AI, emphasizes that this scientific discipline combines a wide range of approaches and techniques, such as machine learning (including *deep learning* and reinforcement learning), automated reasoning (encompassing planning, knowledge representation and optimization) and robotics (which integrates sensors, actuators and control in *cyber-physical* systems)[25].

However, despite this broad description, references appear to be lacking in certain crucial areas, such as natural language understanding and generation, which are fundamental for systems that interact with textual data or with human beings.

It is therefore clear that the formulation of a precise and comprehensive definition of AI is a rather arduous task, since, far from being a single scientific or technological discipline, it represents a heterogeneous set of methods and techniques applied to highly diverse objectives. From this it follows that the legal definition of AI requires a teleological approach capable of encompassing those systems that present the risks and opportunities associated with intelligent applications.

Such an approach is, of course, reflected in the European Regulation, which applies its most significant provisions exclusively to systems classified as "*high-risk*"; therefore, the focus, rather than being placed on a generic qualification as an "*AI system*", should instead be centered on verifying whether the system falls within the categories of high-risk systems identified by the Regulation[26].

In workplaces in particular, as will shortly be seen, AI is implemented in systems and machinery capable of analyzing and predicting situations with speed and precision that

[25] AI-HLEG, *High-Level Expert Group on Artificial Intelligence*, A definition of AI: Main ca pabilities and scientific disciplines, European Commission, 2019. The original text read as follow: "*As a scientific discipline, AI includes several approaches and techniques, such as machine learning (of which deep learning and reinforcement learning are specific examples), machine reasoning (which in cludes planning, scheduling, knowledge representation and reasoning, search, and optimization), and robotics (which includes control, perception, sensors and actuators, as well as the integration of all other techniques into cyber-physical systems)*".

[26] G. SARTOR, "*L'intelligenza artificiale e il diritto*", *cit*., pp. 7-9.

surpass human capabilities, and of supporting workers in a manner similar to an assistant, performing complex tasks with greater efficiency.

Experts distinguish between two main categories of AI: weak and strong. The former, which is the most widespread today, refers to systems designed to perform specific tasks through the use of advanced software, where, moreover, such systems, far from possessing awareness or general autonomous capabilities, solve well-defined problems, such as image or text recognition and the operation of expert systems.

Conversely, strong AI, also referred to as "*universal AI*"[27], denotes a level of intelligence where a machine possesses the capability to match or exceed human competencies across a significant array of tasks. This latter notion was examined by Alan Turing in 1950 with the seminal inquiry "*Can machines think?*", which anticipates an agent that can adapt and optimize its behavior across diverse environments, endowed with universal abilities such as ambulation, vision, and verbal communication[28].

Furthermore, in the context of enhancements in computer memory capacity and the evolution of increasingly sophisticated algorithms, universal AI appears progressively less remote, potentially facilitating the completion of the automation process, allowing robots to undertake human tasks devoid of biological limitations such as fatigue or illness. Nonetheless, there appears to be a prevailing preference for weak AI, as it augments machine capabilities without the inherent risk of wholly supplanting human labor or governance, thereby reflecting a fundamental tension between the aspiration for innovation and the imperative to retain human oversight over technological advancements.

3. Algorithms, robotics, and ambient Intelligence: the future of technologies between innovation and ethical safeguards.

Given the aforementioned premises, to effectively address the issue at hand, it is imperative to provide definitions, specifically pertaining to artificial intelligence, algorithm, and automated process. Their analysis is crucial for comprehending the various issues related to the psychological and physical protection of workers, as well as the ensuing necessity for guarantees concerning human supervision and transparency.

[27] M. HUTTER, "*One decade of universal artificial intelligence*", Theoretical Foundations of Artificial General Intelligence, 2012, 4, pp. 67-88.
[28] A. M. TURING, "*Computing machinery and intelligence*", Mind 49, 1950, pp. 433-460.

Moreover, this analysis facilitates the examination of existing regulatory responses (*de iure condito*) and those currently under development (*de iure condendo*), thereby enabling the identification of communication channels between diverse regulatory frameworks and access points that aim to promote a more common and participatory approach.

Commencing with the term "algorithm," it is noteworthy that it frequently serves as the predominant concept concerning AI applications, to the extent that it features in phrases such as "*algorithmic decision-making*," "*algorithmic governance*," or "*algorithmic constitutionalism*".

However, such reasoning would result in the conflation of the concept of AI with that of the algorithmic dimension, given that AI constitutes only one facet of a broader domain wherein algorithms are applicable.

Algorithms, understood as procedures that can be executed automatically, are utilized across all computer systems, not solely within AI systems.

Specifically, they may range from simple applications, such as those employed for sorting lists of words or calculating the greatest common divisor, to more complex implementations, including encryption, digital file compression, voice recognition, or financial forecasting.

From this, it can be deduced that, while not all algorithms are directly related to AI, every AI system, conversely, necessarily relies on algorithms, some of which perform specific functions connected to artificial intelligence. The algorithms used in AI systems perform various functions, both practical and epistemic, such as reasoning, perception, classification, planning and decision-making.

While some algorithms simply apply predefined rules, others, instead, carry out forms of learning, modifying or developing models based on available data; for example, an AI system for e-commerce may either merely apply fixed rules, such as granting discounts to certain consumers, or learn correlations between user activities and their preferences in order to provide personalised recommendations or enhance business strategies.

In general, an AI system encompasses several algorithms that interact with one another, thereby forming a complex whole. Such systems include algorithms that execute specific functions and others that programme their operation, activating lower-level ones: for instance, a bot that responds to questions in natural language employs algorithms for voice recognition, syntactic understanding, retrieval of relevant information and generation of responses.

In machine learning systems, moreover, the main element, far from being the final algorithmic model (such as a neural network[29]), is a learning algorithm that creates or modifies that model; for example, in an image classification system based on neural networks, the so-called "*learning*" algorithm adjusts the weights of the connections within the network[30] in order to improve its performance, adapting it to the required task, such as recognising faces, sounds or emotions. Some question whether AI systems can be regarded as algorithms in the traditional sense, given that their functioning, rather than being based solely on predefined instructions, focuses on processes that adapt to new contexts, developing behaviours not foreseen by their designers.

This distinction was addressed in a ruling by the Italian Council of State[31], which, in essence, defined an algorithm as a finite sequence of precise and unambiguous instructions, linking it to the concept of automation; AI, by contrast, tends to include algorithms which, thanks to *machine learning*, far from merely applying preset rules, are geared towards developing new inference criteria, making decisions based on learning.

This distinction raises two sets of issues.

Firstly, it should be clarified that not all AI systems use machine learning methods, since some are based on knowledge representations provided by human beings.

Secondly, even in those AI systems that do employ machine learning, both the learning algorithm and the learned model may be considered algorithms, albeit in a broad sense; the latter, however, much like a trained neural network, may be opaque and difficult to interpret in its details, even though it may be perfectly functional for the machine.

Lastly, the concept of an algorithm may also be extended to those systems that introduce random variations aimed at generating new solutions, such as those based on reinforcement learning or genetic algorithms; in such cases, machines are capable of exploring new possibilities through random mutations or combinations, privileging the most effective solutions.

In conclusion, in order to understand the relationship between algorithms and AI, it would be more appropriate to adopt a broader conception of the algorithm, one that includes within it

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[29] J. ZELEZNIKOW, A. STRANIERI, "*The Split-Up System: Integrating Neural Networks and Rule BasedReasoninginthe LegalDomain*", in Proceedings of the Fifth International Conference on Artificial Intelligence and Law (ICAIL), ACM, 1995, pp. 185-94; F. BARBAROSSA, "*Simulation of Ver dicts in Civil Liability*", in World Congress on Neural Networks, WCNN, San Diego California USA, June 5-9 1994, Hillsdale New Jersey USA, 1994, vol. I, pp. 432-436.

[30] L. PHILLIPS, "*Distribution of damages in car accidents through the use of neural networks*", in CARDOZO L. Rev., vol. XIII (1991), pp. 987-1000.

[31] See, Council of State, third section, sentence 25 November 2021, n. 7891.

those specific to AI, rather than restricting the concept solely to traditional algorithms, thereby excluding artificial intelligence programmes.

A second concept linked to the phenomenon of AI is that of robotics, a discipline concerned with the design of physical agents capable of performing tasks that involve interaction with and manipulation of the physical environment; according to the *High-Level Expert Group on AI*, robotics may be defined as a form of AI applied to the real world, also referred to as so-called "embodied" AI. Essentially, a robot is a physical machine designed to cope with the dynamics, uncertainties and complexities present in the physical world, whose abilities of perception, reasoning, action, learning and interaction with other systems are integrated within the control system that governs its functioning.

Moreover, beyond AI, there are disciplines such as mechanical engineering and control theory that contribute to the design and operation of a robot; among the most common examples are robotic manipulators, autonomous vehicles such as cars, drones and air taxis, humanoid robots and domestic robots such as automated vacuum cleaners[32].

In addition, it should be noted that the term "*robot*", or "*bot*", may also refer to digital software that actively interacts in virtual contexts, for instance by carrying out online commercial transactions, such as the buying and selling of securities; it is clear that, whether in physical or digital robots, AI nonetheless represents the central element, albeit operating in synergy with other technologies and disciplines.

Indeed, a physical robot is generally defined as a machine capable of perceiving the environment through sensors, processing information in a way similar to human cognition, and acting through actuators[33]; sensors, such as cameras, lasers, *GPS*, gyroscopes or accelerometers, process and provide data concerning the environment and the robot's

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[32] AI-HLEG, *High-Level Expert Group on Artificial Intelligence*, "*A definition of AI: Main capabilities and scientific disciplines*", European Commission, 2019.The original text read as follow: "*A robot is a physical machine that has to cope with the dynamics, the uncertainties and the complexity of the physical world. Perception, reasoning, action, learning, as well as interaction capabilities with other systems are usually integrated in the control architecture of the robotic system. In addition to AI, other disciplines play a role in robot design and operation, such as mechanical engineering and control theory. Examples of robots include robotic manipulators, autonomous vehicles (e.g. cars, drones, flying taxis), humanoid robots, robotic vacuum cleaners, etc*".

[33] G. A. BEKEY, "*Current Tends in Robotics: Technology and Ethics*", in *Robot Ethics: The Ethical and Social Implications of Robotics*, MIT, 2012, p. 18-34, p. 18. The original text read as follow: "*A machine, situated in the world, that senses, thinks, and acts. Thus, a robot must have sensors, processing ability that emulates some aspects of cognition, and actuators. Sensors are needed to obtain information from the environment. Reactive behaviours (like the stretch reflex in humans) do not require any deep cognitive ability, but on-board intelligence is necessary if the robot is to perform significant tasks autonomously, and actuation is needed to enable the robot to exert forces upon the environment. Generally, these forces will result in motion of the entire robot or one of its elements (such as an arm, a leg, or a wheel)*".

movement, while actuators, instead, enable the robot to exert force and move through components such as legs, wheels, arms or grippers.

Robots may be classified into three main categories: manipulators, mobile robots and mobile manipulators[34].

The first category includes robots anchored to a fixed workstation, such as the mechanical arms used on industrial assembly lines or in healthcare settings to perform high-precision surgical operations. The second category, instead, operates autonomously using various locomotion systems, such as wheels, legs or propellers; some mobile robots perform, by way of example, simple tasks within relatively confined spaces, such as floor cleaning or grass cutting, whereas others, endowed with greater autonomy, undertake more complex duties in environments shared with humans or in unexplored territories, such as the rovers used for lunar or Martian exploration.

In recent years, moreover, the development of autonomous vehicles, such as cars and drones, has represented one of the most significant innovations; indeed, robotised cars, equipped with sensors capable of detecting obstacles and technologies for autonomous driving, are already operational in certain areas, such as driverless vehicles capable of transporting people or goods without human intervention, just as there exist autonomous underwater vehicles (AUVs) and unmanned aerial vehicles (UAVs), which are employed in a variety of fields, from surveillance to agricultural work, and even military operations.

Lastly, mobile manipulators, equipped with both movement and manipulation capabilities, represent a further advancement in robotics, as these robots are designed to perform complex tasks, such as the disarming of explosive devices, or anthropomorphic robots, known as humanoids, which imitate the physical structure and movements of human beings.

Robotics, understood in a broader sense, may well encompass both devices such as intelligent prostheses, designed to replace parts of the human body with advanced cognitive functionalities, such as artificial limbs or systems intended to enhance hearing or sight, and so-called *multi-body robots*, consisting of groups of independent devices that coordinate with one another, forming swarms capable of autonomous collaboration.

A final concept deserving particular attention is that of so-called *ambient intelligence*[35], which envisages the integration, within a physical environment, of automatic devices capable of processing information and exhibiting intelligent behaviour.

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[34] S. J. RUSSELL, P. NORVIG, "*Artificial Intelligence. A Modern Approach*", 4a ed., Pearson, 2021, chapter 26.

[35] J. VAN HELVERT, C. WAGNER, "*From Scenarios to "Free-Play": Evaluating the User's Experience of Ambient Technologies in the Home*", in Ultes, S., Nothdurft, F., Heinroth, T., Minker, W. (eds) Next Generation

Such devices, in particular, operate across various contexts, as they collect data both from the physical environment and from computer networks; indeed, the goal is to render them ubiquitous and invisible, enabling them to manage different types of machines and to adapt, automatically, the environment to human needs.

Furthermore, these devices are also capable of communicating with one another, interacting with other digital systems, perceiving changes in the environment, and responding to such variations.

Such a scenario was described by Philips, one of the first companies to use the term "*ambient intelligence*", as a digital environment designed to make people's lives easier and more comfortable through the implementation of electronic devices capable of responding to individual needs by personalising themselves, anticipating behaviours, and reacting to human presence[36].

The European Union itself, embracing this vision, has devoted considerable attention to ambient intelligence within its research projects[37].

However, it cannot be denied that, alongside the potential benefits, a number of rather critical issues have been raised, requiring appropriate legal safeguards.

For example, a particularly pressing concern relates to the protection of personal data, liability for potential damage caused by intelligent devices, and the protection of users against possible forms of exploitation and manipulation; this latter aspect is of significant importance, given that the control exercised by intelligent machines could potentially influence user behaviour, for instance by directing their choices as consumers and/or purchasers.

Whereas in the past the development of science and technology rendered the material world a domain in which objects were deemed predictable and fully comprehensible through the physical laws governing their operation[38], ambient intelligence instead brings us back into a

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Intelligent Environments. Springer, Cham., 2016, pp. 325-344; S. WRIGHT, A. STEVENSON, "*Intelligent Spaces: The Vision, the Opportunities and the Barriers*", Springer, London, 2006; L. BURZAGLI, P.L. EMILIANI, S. NALDINI, "*From Ambient Assisted Living to Society Ambient Living*", in Leone, A., Caroppo, A., Rescio, G., Diraco, G., Siciliano, P. (eds) *Ambient Assisted Living*. ForItAAL 2018. Lecture Notes in Electrical Engineering, 2019, vol 544. Springer, Cham., pp. 35-45; J. BENNETT et. al, "*Towards an Ambient Intelligent Environment for Multimodal Human Computer Interactions*", in Streitz, N., Konomi, S. (eds) Distributed, Ambient and Pervasive Interactions. HCII 2020. Lecture Notes in Computer Science(), 2020, vol 12203, Springer, Cham., pp. 164-177; J. MYERS, "*Ambient Media Theory and Its Place in Media Studies*", in Media Ecology for the 21st Century. Palgrave Macmillan, Cham., 2025, pp. 137-148.

[36] B. DE RUYTER, P. RESEARCH, "*Ambient intelligence*".

[37] EuroTRUSTAmI workshop, "*European R&D towards trusted Ambient Intelligence. In: Developing Ambient Intelligence*", Springer, Paris, 2008, pp. 180-239; A. MANA, C, RUDOLPH, "*Developing Ambient Intelligence*", Springer, Paris, 2008.

[38] M. WEBER, "*La scienza come professione*", Bompiani, [1919] 2008.

context in which objects interact with human beings in a manner akin to that which occurs between people.

In the near future, although the process is already under way through devices such as *Alexa* or *Google Home*, one might interact with a reality in which even ordinary objects will be capable of pursuing their own objectives, accompanied by the ability to choose autonomously the means to achieve them, all while remaining oriented towards the fulfilment of human needs[39]. However, in order to prevent such a situation from getting out of hand, through, for instance, the risk of control or manipulation of these objects or of those who, in turn, control them, it is deemed appropriate that the technological development be accompanied by considerations of ethics and law, so as to ensure that ambient intelligence operates in a manner that is safe, transparent, and respectful of the dignity and rights of its users.

4. Big Data and Artificial Intelligence: opportunities and impacts on work and the economy.

Another concept that deserves to be mentioned is that of the so-called *Big Data*, which essentially identifies the practice of collecting such vast amounts of data that they become difficult to manage using traditional information technologies employed for the processing of digital data, such as databases and document management systems.

These large quantities of data are characterised by the so-called "three Vs": an enormous *Volume*, a high *Velocity of update or change*, and a great *Variety of information* composing them.

Furthermore, other peculiarities associated with *Big Data* have emerged, including low *Veracity*, consisting in a high likelihood that some data may be inaccurate or erroneous, and high *Value*, referring to the usefulness of the information extracted from these datasets through advanced analytical techniques[40].

The data that constitute *Big Data* may be generated directly by human beings, although they are often collected automatically by devices that acquire information from the physical environment (for example, surveillance cameras, environmental sensors, medical equipment,

[39]In this regard, it is necessary to clarify that, in fact, the functioning of an intelligent object can also be explained through the physical laws governing it. However, given the technological complexity of such objects, the variability of their behaviours, and the opacity of the internal mechanisms that regulate them, a more teleological approach to interpreting their operation appears preferable in order to achieve a full understanding. Similarly, only through a communicative perspective will it be possible to interact with such devices appropriately and effectively. See, in this regard, D. C. DENNETT, "*Kinds of Minds: Towards an Understanding of Consciousness*", Basic, 1997.

[40] A. BADMAN, M. KOSINSKI, "*What are Big Data?*", 2023, in https://www.ibm.com/think/topics/data.

and sensors applied to industrial or commercial products) or that mediate economic and social activities (such as e-commerce transactions, e-government initiatives, or the tracking of online activities).

From a social and legal standpoint, moreover, the main characteristic that makes these vast data collections significant lies in their capacity to be used for advanced analyses, as well as for identifying correlations and making predictions; this is a process increasingly centred on AI technologies based on machine learning, which make it possible to extract predictive models from extensive datasets. *Big Data* may, moreover, encompass a wide range of domains, including both the non-human physical and digital worlds (as in the case of astronomical, environmental, biological, industrial, and technological data) and human activities and their interactions (as in the case of data relating to social networks, health, finance, or transport).

As regards the predictive function of *Big Data*, it should be noted that the use of machine learning technologies may entail both remarkable opportunities and considerable risks that must not be underestimated.

As to the former, advantages include easier access to information, wider dissemination of knowledge, and certainly broader and faster production of content.

Such technologies may also reduce costs, increase productivity, and create new economic value, paving the way for more appealing, creative, and well-paid employment opportunities. Furthermore, the personalisation of public and private services based on the preferences and needs of each individual should not be overlooked, nor should the encouragement of sustainable management of energy, infrastructure, and logistics, supporting the development of innovative information and advisory services, contributing to improved transparency in public and private decision-making, and reducing the likelihood of bias and discrimination[41].

Nevertheless, it should be emphasised that the use of AI tools, and, more precisely, algorithmic instruments designed to reduce discriminatory phenomena, presents an evident paradox, insofar as part of the discrimination generated by such tools appears to be attributable to human beings themselves. In essence, firstly, algorithmic tools are intended to enhance the decision-making process, thereby reducing certain biases arising from human decisions; secondly, an automated decision-making process (albeit not fully automated, so as

[41] O. LOBEL, "*The Equality Machine*", PublicAffairs, 2022; P. HACKER, "*Teaching Fairness to Artificial Intelligence: Existing and Novel Strategies Against Algorithmic Discrimination Under EU Law*", in Common Mkt. L. Rev., 2018, 55(4), p. 1184-1185.

to avoid breaching article 22 GDPR) may assist in identifying forms of discrimination that would otherwise be difficult to detect.

Although such algorithmic instruments have been regarded as "black boxes" whose operational mechanisms are not easily intelligible[42], it must be noted that the human mind is even less intelligible, given the difficulties associated with proving discrimination perpetrated by a human being[43] (unless, within an employment relationship, there is an explicit statement by the employer[44]), as well as the challenge of acquiring information often known exclusively to the discriminator[45], who may, in turn, be unaware of the discriminatory nature of their behaviour, being influenced by implicit biases[46]. In this sense, within the employment context, the fact that the algorithmic decision-making process is traceable may facilitate both the prevention and repression of discriminatory practices.

On the one hand, traceability allows for prior awareness of discrimination risks, thereby enabling the employer to correct the algorithmic decision-making process with the aim of minimising such risks[47], ensuring a level of accuracy certainly unattainable by human beings[48].

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[42] F. PASQUALE, "*The Black Box Society. The Secret Algorithms That Control Money and Information*", Harvard University Press, 2016; J. BURRELL, "*How the machine 'thinks': Understanding opacity in machine learning algorithms*", in BD&S, 2016, 1.

[43] J. GERARDS, R. XENIDIS, "*Algorithmic Discrimination in Europe: Challenges and Opportunities for Gender Equality and Non-discrimination Law*", 2020, p. 121, in Algorithmic Discrimination in Europe: Challenges and Opportunities for Gender Equality and Non-Discrimination Law - University of Edinburgh Research Explorer ; O. LOBEL, *cit*., p. 46.

[44] O. LOBEL, "*The Equality Machine*", *cit*., p. 48; A. KELLY-LYTH, "*Algorithmic discrimination at work*", in ELLJ, 2023, 14(2), p. 160.

[45] O. LOBEL, "*The Equality Machine*", *cit*., p. 48.

[46] J. GERARDS e R. XENIDIS, "*Algorithmic Discrimination in Europe: Challenges and Opportunities for Gender Equality and Non-discrimination Law*", *cit*., p. 122.

[47] P. HACKER, "*Teaching Fairness to Artificial Intelligence: Existing and Novel Strategies Against Algorithmic Discrimination Under EU Law*", in CMLRev., 2018, 55(4), pp. 1184-1185; O. LOBEL, "*The Equality Machine*", *cit*., pp. 27-28.

[48] The *Deliveroo* and *Amazon* cases have demonstrated that the use of AI in corporate processes, far from eliminating the risk of discrimination, often merely renders it more visible. In the Deliveroo case, indeed, greater awareness of the potential distortive effects of algorithms, both in reputational terms and with respect to litigation, could have prompted the company to intervene proactively, thereby mitigating the discriminatory impact before it became publicly apparent. Similarly, the Amazon case reveals how AI is capable of amplifying biases already present within an organisation. In this regard, the well-known recruitment algorithm did not "create" discrimination; rather, it made it more explicit and systematic, bringing to light a human prejudice that, without automation, would likely have remained invisible, diluted within everyday practices. In both cases, what emerges is not so much a technological failure as a deficit of governance: indeed, the absence of critical oversight of automated systems, and of the human logics from which they derive, transforms companies from mere users of digital tools into unwitting magnifiers of their own biases. It must be remembered that AI does not generate discrimination ex nihilo; instead, it renders it faster, more consistent, and more difficult to ignore. See, G. GAUDIO, "*Le discriminazioni algoritmiche*", in LDE, vol. 4, 1, p. 15.

On the other hand, such traceability makes it possible to uncover discriminatory practices carried out by humans that, in the absence of these technologies, would be difficult to prove in Court[4950].

It is clear, in light of the foregoing, that for algorithmic management tools to adequately fulfil their preventive and repressive functions with respect to discriminatory practices in the workplace, it is necessary to establish effective rules capable of revealing discrimination risks, thus permitting employers to prevent them and guaranteeing workers the ability to prove such discrimination in legal proceedings[51].

Furthemore, these are technological systems that enable significant progress in multiple sectors, such as in the discovery of correlations by scientists or the formulation of hypotheses and the development of models based on concrete data; in this respect, for instance, doctors would have the opportunity to make more accurate diagnoses and propose more effective treatments, while businesses could anticipate market dynamics, and consumers would be guaranteed the ability to make informed choices and receive personalised services.

According to a segment of the scholarly community, namely enthusiasts and those involved in the artificial intelligence industry, AI may offer extraordinary opportunities: by way of illustration, according to the view of Ray Kurzweil, renowned inventor, futurist and director of engineering research at *Google*, these technologies could address major global challenges, such as preserving a healthy environment, ensuring sufficient resources for a growing population, combating disease, extending human life and eliminating inequalities[52].

However, it must be acknowledged that the adoption of AI tools has made pre-existing inequalities more visible. In this regard, numerous studies have shown that, within the

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[49] A. KELLY-LYTH, "*Algorithmic discrimination at work*", *cit*., pp. 167-168.

[50] The Amazon case, in this respect, represents a particularly emblematic example of how automation can render visible forms of discrimination which, although already present in data or corporate practices, would otherwise be difficult to detect. The algorithm, indeed, did not introduce a new bias; it merely replicated, amplified, and systematized a pre-existing prejudice, transforming what had been latent into a concrete and measurable effect on recruitment decisions. It was precisely this systematization, together with the traceability of the algorithmic decision-making process, that made it possible to identify the discrimination with greater clarity, providing victims with more robust evidentiary tools and reducing the scope for corporate justifications based on subjective assessments or opaque criteria. Automation, in this sense, removed every alibi: what could previously be attributed to occasional human error appeared instead as a form of direct, structured, and verifiable discrimination. Paradoxically, therefore, technology can not only amplify biases but also render them more transparent, compelling organisations to confront their responsibilities rather than conceal them behind the purported "neutrality" of the algorithm.

[51] G. GAUDIO, "*Le discriminazioni algortimiche*", in LDE, 2024, 1, pp. 13-15.

[52] R. KURZWEIL, "*How to Create a Mind*", Viking, 2012. The original text reads as follow: "*Through [information] technologies we can address the grand challenges of humanity, such as maintaining a healthy environment, providing the resources for a growing population (including energy, food, and water), overcoming disease, vastly extending human longevity, and eliminating poverty. It is only by extending ourselves with intelligent technology that we can deal with the scale of complexity needed*".

healthcare sector, for example, algorithms applied to dermatology or oncological diagnosis have discriminated against non-white individuals[53], not due to any intrinsic flaw in the technology itself, but rather as a result of incomplete or insufficiently diverse training data. Similar issues have also arisen in relation to gender, age, disability, and socio-economic factors, revealing how AI risks reinforcing the very inequities it is intended to help reduce.

The stages of drug development and clinical trials are particularly critical in this respect, as limited data variability is less immediately apparent. The predominance of young male subjects from the same ethnic background, together with preclinical studies conducted almost exclusively on male animals, generates partial forms of knowledge that subsequently flow into the datasets used to train algorithms. To this must be added the human biases[54] of researchers and clinicians, which may be unconsciously embedded in the very design of AI systems.

The literature identifies three principal sources of bias: so-called *data-driven biases*, linked to *non-representative datasets*; algorithmic biases, which tend to amplify imbalances present in training data; and human biases, which are the most difficult to detect, as they are deeply rooted in social contexts and in the groups responsible for designing technologies.

Although the spread of open data has broadened access to information, many healthcare databases remain insufficiently diverse, fragmented, and poorly interoperable, thereby limiting the generalisability of algorithms and leaving the most vulnerable populations invisible.

In this context, data standardisation and interoperability emerge as necessary conditions for more equitable AI, yet they are by no means sufficient. In this regard, some scholars[55] advocate an open science approach grounded in inclusivity, transparency, explainability, and reliability, arguing that genuinely open science cannot exist unless it is inclusive from the outset. The sharing of data, methods, and results, when accompanied by inclusive standards, can strengthen scientific rigour, trust, and equity within healthcare systems.

In conclusion, while it is unrealistic to envisage datasets entirely free from bias, tools do exist to mitigate such distortions, ranging from the use of synthetic data to the sharing of algorithmic code, as well as field testing and standardised metrics enabling the assessment of

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[53] H. LEDFORD, "*Millions of Black People Affected by Racial Bias in Health-care Algorithms*", Nature, October 24, 2019.

[54] R. B. PARIKH, S. TEEPLE, A.S. NAVATHE, "*Addressing bias in artificial intelligence in health care*", in JAMA pp. 322, 2377.

[55] N. NORORI et al., "*Addressing bias in big data and AI for health care: A call for open science Patterns 2*", October 8, 2021, pp1-9, in Addressing bias in big data and AI for health care: A call for open science - PMC

accuracy and reliability in AI systems[56]. Nevertheless, the centrality of the trade-off between performance and interpretability remains, as does the need to actively involve patients and communities.

Only AI that is designed in a participatory and reflective manner can avoid becoming yet another factor of exclusion, rather than a tool for progress and equity.

As for the critical issues, it should be noted that the replacement of human labour with intelligent systems could risk devaluing the work of people replaced by machines. many workers could find themselves "*losers in the race against machines*"[57], with the immediate consequence of losing their jobs or seeing their skills devalued, which in turn leads to poverty, social exclusion and a profound loss of confidence in themselves and in society.

A clear example is the impact that autonomous cars could have on taxi drivers and lorry drivers, or that of intelligent chatbots on call centre employees; this highlights the need both to guarantee a decent standard of living for those who may be excluded from the labour market due to automation and, above all, to create new rewarding job opportunities in areas of social relevance.

Furthermore, work environments dominated by computer systems, such as highly automated warehouses where the system guides workers by indicating which packages to pick and where to place them, can create alienating working conditions, as in such contexts, constant and pervasive control is exercised over workers, imposing constant pressure and limiting their decision-making autonomy; this denies workers the opportunity to develop personal skills, work independently and establish connections with others, all of which are important factors for human well-being[58].

Another risk lies in the ways in which AI enables large digital companies to generate huge profits with minimal use of labour, distributing wealth between those who invest in these technologies and those who have the skills to design and implement them, such a scenario tends to promote economic models characterised by a "*winner takes all*" principle, where only a few people, thanks to their exclusive access to data and technologies, monopolise the market, influencing both relations between companies and between workers themselves.

[56] R. PEARL, "*How AI Can Remedy Racial Disparities in Healthcare*", Forbes, February 16, 2021.
[57] E. BRYNJOLFSSON, A. McAFEE, "*Race Against the Machine*", Digital Frontier Press, 2011.
[58] R. M. RYAN, E.L. DECI, "*Self-Determination Theory Basic Psychological Needs in Motivation, Development, and Wellness*", Guilford, 2017.

Among the latter, the only ones who would probably be advantaged are those who can perform high-level tasks, not easily automatisable, while the others, on the contrary, risk being marginalised[59].

However, these negative effects are not inevitable, since investment in worker training, the design of human–machine interaction models that enhance creativity and individual initiative, and the adoption of measures aimed at redistributing resources, data, and technologies could ensure that the benefits of artificial intelligence are equitably distributed, allowing everyone to take advantage of them[60].

4.1. Big Data and profiling: potential and risks in the age of AI.

Another aspect related to the synergy between AI and *Big Data* concerns a significant expansion, together with IT resources, of the possibility of profiling individuals, allowing inferences to be made about their behaviour, preferences and personal features.

Firstly, it should be noticed that automation has reduced the costs of data collection, storage and processing, blocking access to pervasive and constant monitoring; in fact, through sensors and digital platforms, information can be collected on various types of activities, whether they are carried out online or in the physical world, transforming this data into valuable resources used to analyse, predict and influence human behaviour.

Secondly, the specific aspect of profiling is essentially focused on the analysis of personal data in order to classify, evaluate and predict individuals' behaviour; for example, a system appears to be able to determine that those with certain characteristics are more likely to develop a specific health condition or respond to certain commercial incentives.

Well, while such predictions may lead to benefits, such as early diagnosis of diseases or the provision of personalised services, they also carry risks, such as discrimination or manipulation; profiling, in fact, allows both the anticipation and influence of behaviour, inducing desired responses through targeted stimuli, as in the case of specific advertising messages[61].

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[59] A. McAFEE, E. BRYNJOLFSSON, "*Machine, Platform, Crowd*", Norton, 2019.

[60] Y. HARAYAMA et al., "*Artificial Intelligence and the Future of Work*", in Reflections on Artificial Intelligence for Humanity, a cura di B. Braunschweig e M. Ghallab, Springer, 2021, pp. 53-67.

[61] F. BOSCO et al., "*Profiling Technologies and Fundamental Rights and Values: Regulatory Challenges and Perspectives from European Data Protection Authorities*", in Reforming European Data Protection Law, a cura di S. Gutwirthet al., Springer, 2015. The original text reads as follow: "*Profiling is a technique of (partly) automated processing of personal and/or non-personal data, aimed at producing knowledge by inferring correlations from data in the form of profiles that can sub sequently be applied as a basis for decision-making. A profile is a set of correlated data that represents a (individual or collective) subject. Constructing profiles is the*

Furthermore, according to article 4 of the GDPR, profiling specifically concerns the automated processing of personal data useful for assessing individual aspects, such as work performance, economic situation or behaviour.

However, the negative aspects should not be overlooked, such as heavy psychological pressure, or the limitation of personal autonomy and the impact on mental well-being, especially when accompanied by constant surveillance and evaluation.

These are risks that certainly highlight the need for ethical rules and safeguards to balance the benefits and potential negative consequences of profiling.

Continuing with the critical issues characterising profiling, one of the most insidious risks is the prospect of perpetuating discrimination, stereotyping and inequality.

In this respect, given that, as already mentioned above, automation makes it possible, on the one hand, to collect and analyse large amounts of data in order to infer behaviours, preferences or personal features and, on the other hand, these processes allow decisions to be made more quickly and economically than humans, but they can also introduce errors and biases, especially if based on training data sets that reflect pre-existing discrimination.

In essence, AI systems learn from the examples provided in the data and can reproduce or amplify historical inequalities; for example, algorithms used for recruitment may unknowingly penalise certain groups if there are discriminatory past decisions at the source, since the desired outcome (as in the case of certain job performances) is approximated by a proxy (a substitute element) that may well have an indirect discriminatory impact on that particular group[62]. By way of example, reference may be made to the cases concerning the algorithms used by Deliveroo, Foodinho and Amazon, which illustrate how discrimination may arise both from predefined logical rules and from machine learning systems trained on biased data. In the former cases, discrimination may be embedded within the programmed rules, whereas in machine learning systems it may stem from the quality of the training data or from the correlations identified by the algorithm[63].

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process of discovering unknown patterns between data in large data sets that can be used to create profiles. Applying profiles is the process of identifying and representing a specific individual or group as fitting a profile and of taking some form of decision based on this identification and representation". See also M. HILDEBRANDT, "*Profiling and AML*", in The Future of Identity in the Information Society. Challenges and Opportunities, a cura di K. Rannenberg et al., Springer, 2009.

[62] FRA (European Union Agency for Fundamental Rights), "*Bias in algorithms – Aritificial intelligence and discrimination*", Vienna, 2022; FRA, "*Ensuring justice for hate crime victims: Professional perspectives*", Luxembourg, Publications Office, 2016; FRA, "*Getting the future right – Artificial intelligence and fundamental rights*", Luxembourg, Publications Office, 2020; A. AHMAD, Y. VALLES, Y. IDAGHDOUR, "*Bias in AI systems: integrating formal and socio-technical approaches*", 2026, in Bias in AI systems: integrating formal and socio-technical approaches - PMC.

[63] M. PERUZZI, "*La discriminazione algoritmica*", in EQUAL, 2024, pp. 8-10.

Furthermore, even in the presence of criteria that, at least in appearance, may be neutral, such as the number of working hours, there could be a serious risk of disadvantaging certain individuals, such as women, who are generally burdened with greater family responsibilities.
Moreover, the lack of representation for a group in the training data could reduce the accuracy of predictions, leading to incorrect or unfair decisions.
Despite this, algorithms can be improved and made more transparent than human decisions through more effective control over decision-making processes and the mitigation of discrimination[64].
However, automation introduces significant psychological pressure, as individuals are subject to constant evaluations that are often perceived as inevitable.
The challenge for the future is therefore to find an effective balance between AI and human intelligence. While AI can excel in standardised decisions[65] and structured data-based contexts and be used to monitor and improve its own mechanisms, ensuring a more effective decision-making system, human capabilities remain irreplaceable in situations that require creativity, empathy and insight[66].

5. Artificial Intelligence and its implications for workplace safety and well-being: an introduction.

Even though the advent of AI systems has brought significant opportunities for progress and increased productivity, there are still some pretty big issues around health and safety at work.
In this regard, it has been established that stress, discrimination, increased precariousness, musculoskeletal disorders, as well as the risk of work intensification and job loss, represent psychosocial risks in digitised work environments, including episodes of physical violence.
These are risks that, in essence, are exacerbated when existing technological tools are enhanced by AI or when AI is introduced for the first time in the management and design of the workplace.

[64] J. KLEINBERG et al., "*Discrimination in the Age of Algorithm*", in Journal of Legal Analysis, vol. X (2018), pp. 113-174, p. 113. In this regard, through the implementation of appropriate requirements, the use of algorithms can facilitate the analysis and evaluation of the entire decision-making process, making it less arduous to identify potential discrimination. Indeed, by introducing a higher level of precision, algorithms can highlight and render more transparent the interactions between competing values; in this way, they will not be perceived as a threat to be regulated, but rather as an effective tool that, with the proper safeguards, can promote greater fairness.
[65] About the concept of "definition" adopted by AI systems, see p. 14.
[66] G. SARTOR, "*L'intelligenza artificiale e il diritto*", *cit*., pp. 67-75.

In particular, AI can amplify OSH risks, as it enables more advanced forms of monitoring and control, which can take the form of micromanagement, one of the main causes of stress and anxiety among workers[67].

The use of AI also reinforces the importance of giving credibility and, in some cases, authority to so-called "*predictive machines*"[68], i.e. robotic machines and algorithmic processes applied to the workplace.

However, it is important to note that it is not technology itself that generates advantages or disadvantages for OSH, but rather the ways in which it is used that determine favourable or problematic working conditions.

5.1. The integration of Artificial Intelligence and advanced technologies: impact on workers' health and safety.

In the realm of human resources, artificial intelligence is increasingly being employed within the context of so-called *people analytics*, an approach that utilises *big data* and digital tools to examine employee performance, plan workforce allocation, manage talent, and optimise operational processes[69].

Owing to their capacity to collect, monitor, and analyse data in real time, these technologies furnish organisations with profound and actionable insights.

Nevertheless, it is important to recognise that many of the algorithms employed function as "*black boxes*"[70], rendering their decision-making processes opaque, even when they are entrusted with autonomous decision-making or predictive tasks[71].

Although *people analytics* is not exclusively centred on artificial intelligence, the integration of machine learning facilitates the generation of forecasts and insights with minimal direct human intervention, beyond the initial data input.

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[67] P. V. MOORE, "*The threat of physical and psychosocial violence and harassment in digitalized work*", Ginevra, Organizzazione internazionale del lavoro, 2018a.

[68] A. AGRAWAL, J. GANS, A. GOLDFARB, "*Prediction machines: The simple economics of artificial intelligence*", Boston, MA, Harvard Business Review Press, 2018.

[69] L. COLLINS, D.R. FINEMAN, A. TSHUCHICA, "*People analytics: Recalculating the route*", Deloitte Insights, 2017.

[70] F. PASQUALE, "*The black box society: The secret algorithms that control money and information*", Boston, MA, Harvard University Press, 2015.

[71] A. AGRAWAL, J. GANS, A. GOLDFARB, "*Prediction machines: The simple economics of artificial intelligence*", *cit*.

The strategic significance of such data, particularly when sourced from large-scale datasets, is underscored by the substantial investments made by organisations to acquire information capable of yielding tangible business benefits.

In human resources contexts, such data are employed to train algorithms capable of analysing and predicting employee behaviour by identifying patterns within the data, providing management with tools to make faster and more effective decisions than would be possible in the absence of AI (so-called *algorithmic management*). Moreover, data collected on employees may originate from a variety of sources, both internal and external to the workplace: for instance, keystrokes, social media information, phone calls, websites visited, GPS location, voice tone, or bodily movements analysed via sensors. This approach, also known as human analytics or talent analytics, assists organisations in making informed decisions across multiple areas, including recruitment, performance evaluation, promotions, attrition management, and the identification of future leaders.

In addition, people analytics can be effectively used to detect trends relating to employee health, morale, and attendance, thereby facilitating improvements in strategic personnel management. At present, in the context of China, artificial intelligence is transforming the human resources sector through the introduction of so-called 'AI recruiters', which have proven capable of analysing curricula, planning interviews and assessing candidates in a rapid and effective manner. It is evident that the use of AI in recruitment has grown significantly, involving more than 70 per cent of companies in 2024 and enabling more personalised services, talent analytics and targeted training. The Chinese government has actively supported this digital transformation by promoting the use of big data, cloud computing and artificial intelligence to improve the matching of labour supply and demand and to enhance the efficiency of the labour market[72]

Such technologies, however, while, as noted above, implemented to optimise decision-making processes and enhance the integration of information collected from employees, give rise to ethical issues and have significant implications for occupational health and safety, given that constant monitoring can lead to heightened stress, micromanagement, and performance pressure, with associated physical and psychosocial risks.

Another example of AI application is the video analysis of job interviews, employed by companies such as Nike and Unilever. In this regard, technological systems such as HireVue

[72] C. SI, K. LIU, "*AI recruiters' refine China's hiring model. Use of digital human resources services promotes higher-quality employment*", in 'AI recruiters' refine China's hiring model - Chinadaily.com.cn., 2025; PWC, *"Artificial intelligence in HR: A no-brainer"*, *cit*.

use AI to analyse candidates' verbal and non-verbal signals; in this case, although the aim is to reduce human biases, it has been found that the algorithms are capable of replicating systemic discrimination present in the training data, favouring candidates who reflect dominant demographic patterns[73].

In light of this, it can be concluded that people analytics presents both benefits and risks, as it can provide powerful tools to improve human resource management, yet in the absence of adequate testing and oversight, it may expose employees to discrimination and stress. Therefore, to ensure the fair and effective use of AI, there is a need to design algorithms that minimise biases and actively involve employees in the decision-making process, as only a balance between technological innovation, ethical considerations, and human participation can address the occupational health and safety risks associated with such technologies.

Another sector in which AI is being increasingly applied is the industrial sector, where one can imagine the use of large robotic arms moving at rapid speeds in factories and warehouses to assemble car parts or replace traditional conveyor belts that were previously operated alongside human workers.

In many cases, robots have effectively taken the place of workers along production lines, which generates some confusion between AI and automation, that, in essence, involves the direct replacement of a human activity with a machine, as in the case of a robotic arm performing tasks that were formerly carried out by a human operator.

In this regard, one can consider a report by EU-OSHA (*Perspectives on new and emerging occupational safety and health risks related to digitalisation up to 2025*), which highlights that the use of robots can, on the one hand, reduce occupational health and safety (OHS) risks, particularly in hazardous activities or environments highly exposed to chemical and ergonomic hazards, while, on the other hand, there is a risk that less-skilled manual workers remain exposed to automation-related risks.

At present, the latter appears to be enhanced by AI, which enables machines to exhibit behaviours with a certain degree of autonomy; this could render both workers' manual labour and their cognitive input redundant in certain production processes. Indeed, an EU-OSHA report notes that robots, although initially designed to perform simple tasks, now seem equipped with AI that allows them to "think" and make decisions independently[74]. In modern industries, *cobots* (also known as *collaborative robots*) are becoming increasingly

[73] R. FELONI, "*I tried the software that uses AI to scan job applicants for companies like Goldman Sachs and Unilever before meeting them, and its not as creepy as it sounds*", Business Insider UK, 2017.

[74] J. KAIVO-OJA, "*A review on the future of work: Robotics*", Discussion paper, Bilbao, European Agency for Safety and Health at Work, 2015.

widespread, designed to work alongside humans; unlike traditional robots, they assist human operators across a wide range of tasks without posing the risk of complete process automation.

In this context, companies such as Amazon have implemented over 100,000 AI-powered *cobots* with the aim of reducing worker training time to just two days; similarly, other companies such as *Airbus* and *Nissan* employ cobots to improve efficiency and accelerate production[75].

However, a report by TNO (the *Netherlands Organisation for Applied Scientific Research*)[76] appears to have identified three categories of OSH risks arising from the interaction between humans, *cobots*, and the environment: the "*robot–human collision risks*", generated by unpredictable robot behaviours resulting from machine learning; the so-called "*cybersecurity risks*", arising from the vulnerability of *Internet-connected robots*, which may be subject to attacks or software malfunctions; and, finally, the so-called "*environmental risks*", related to sensor deterioration or unpredictable human behaviour in unstructured environments.

Moreover, through voice recognition and computer vision systems, AI may enable the replacement of both manual and repetitive tasks, as well as work characterised by higher complexity[77]; for example, in a chemical company producing optical components, AI has been implemented to scan microchips for defects, thereby eliminating the manual task previously performed by an operator who spent considerable time observing repetitive images, and reducing the risk of visual fatigue and musculoskeletal disorders[78].

However, even in these contexts, not all that glitters is gold; although cobots can significantly improve working conditions by reducing repetitive tasks and physical strain, issues may arise if they are inadequately integrated[79].

For instance, a major source of stress and psychosocial risk could emerge if workers are required to keep pace with cobots, rather than adjusting the machines to human rhythms[80];

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[75] P. V. MOORE, "*Artificial Intelligence: Occupational Safety and Health and the Future of Work*", 2020, in https://www.stjornarradid.is/lisalib/getfile.aspx?itemid=4061219d-3a73-11e9-9432-005056bc530c.; EUROPEAN PARLIAMENT, "*Opportunities of Artificial Intelligence*", 2020, pp. 39-40.

[76] TNO, *Organizzazione neerlandese per la ricerca scientifica applicata*, "*Emergent risks to workplace safety; Working in the same space as a cobot*", Report for the Ministry of Social Affairs and Employment, The Hague, 2018.

[77] C. FREY, M.A. OSBORNE, "*The future of employment: How susceptible are jobs to computerisation?*", Oxford, University of Oxford, Oxford Martin School, 2013.

[78] EU-OSHA, "*La SSL e il lavoro del futuro: vantaggi e rischi degli strumenti di intelligenza artificiale nei luoghi di lavoro*", in EU-OSHA, 2019, p. 7.

[79] EU-OSHA, "*La SSL e il lavoro del futuro: vantaggi e rischi degli strumenti di intelligenza artificiale nei luoghi di lavoro*", *cit*., pp. 6-7.

[80] See the interview conducted with Dr Sam Bradbrook, specialist at the Foresight Centre of the United Kingdom Health and Safety Executive (HSE), in September 2018.

similarly, employees monitoring cobots via personal devices, such as smartphones, may experience work overload, feeling obliged to respond to notifications outside working hours, thereby compromising their work–life balance.

Other challenges associated with the adoption of AI and *Internet of Things* (IoT) systems in the workplace should not be overlooked. Technical problems, such as sensor errors or system malfunctions, could raise questions regarding legal liability, for example, if a cobot collides with a worker, it becomes unclear whether responsibility lies with the robot, the worker, the manufacturer, or the employing company.

It is evident that, to adequately address such risks, cobots must be capable of distinguishing between objects and humans, anticipating collisions and adapting their behavior; they should also possess sufficient memory to learn from data and act autonomously, thereby contributing to the creation of a safer and more integrated working environment, while ensuring ethical, responsible, and beneficial human–robot interactions[81].

Another application of AI systems is the use of *chatbots*, increasingly deployed to handle a wide range of customer service requests, allowing call centre operators to focus on more complex issues.

These tools are designed to support humans, both physically and in back-end systems, where natural language processing technologies are employed to respond to customer inquiries; for example, *Dixons Carphone* uses a conversational *chatbo*t called *Cami*, designed to answer first-level queries regarding the *Currys* website and *via Facebook* Messenger. Additionally, *Nuance*, an insurance company, introduced *Nina* in 2017, a chatbot capable of responding to customer questions and providing access to documentation. Similarly, *Morgan Stanley* equipped 16,000 financial advisors with machine learning algorithms to automate routine tasks[82].

From an occupational health and safety perspective, it is well known that call centre work entails non-negligible risks due to the repetitive, stressful, and heavily monitored nature of the tasks, where intensive performance monitoring is often linked to significant pressure on workers[83].

Furthermore, modern technologies allow for the extraction of data from written or spoken words to analyse employee mood through a process known as *sentiment analysis*; facial

[81] EU-OSHA, "*La SSL e il lavoro del futuro: vantaggi e rischi degli strumenti di intelligenza artificiale nei luoghi di lavoro*", *cit*., pp. 6-7.

[82] EU-OSHA, "*La SSL e il lavoro del futuro: vantaggi e rischi degli strumenti di intelligenza artificiale nei luoghi di lavoro*", *cit.,* pp. 7-8.

[83] J. WOODCOCK, Woodcock, "*Working the phones: Control and resistance in call centres*", Londra, Pluto Press, 2016.

expressions can also be monitored to detect signs of fatigue or emotional states that may affect workplace well-being, with the aim of mitigating OSH risks associated with excessive workloads[84].

However, despite their assistive purpose, chatbots can pose a psychosocial risk, as they raise concerns among workers regarding the possibility of job loss or replacement.
It is therefore essential that employees receive adequate training to understand the role and functions of the automated systems implemented in the workplace, and that the design of such tools is clearly explained, so that they fulfil the noble objective of collaborating with and supporting human work, rather than replacing it.

An interesting and rapidly growing technological system in the workplace is wearable devices for so-called *self-tracking*. In this regard, it has been observed that the value of such tools in the industrial and healthcare sectors rose from $21 million in 2013 to $9.2 billion by 2020, with over 13 million fitness devices integrated into workplaces between 2014 and 2019. Tools such as *GPS*, radio-frequency identification, and tactile tracking bracelets, such as those used by *Amazon* in 2018, have replaced traditional instruments like clipboards and pencils in warehouses and factories, thereby innovating production processes.
One of the most significant developments in AI-enhanced automation concerns batch production, which differs from traditional mass-production models; this approach allows workers to use devices such as virtual reality glasses (e.g., *HoloLens* or *Google Glass*) or tablets, which provide real-time visual instructions directly at the workplace[85].

Unlike the classic assembly line, where employees repeatedly perform the same task, this new methodology involves smaller orders to be completed within specific timeframes, thereby reducing the rigidity of mass production; workers can thus learn new and customised tasks to complete only the order at hand.

However, even in this case, the risks posed to occupational health and safety cannot be overlooked[86]: for example, the use of on-the-job training devices eliminates the need to rely on pre-existing skills or long-term training, as workers are effectively guided step by step and case by case, without the opportunity to develop specialised abilities.

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[84] M. WANKHADE, ACS RAO, C. KULKARNI, "*A survey on sentiment analysis: methods, applications and challenges*", Springer, 2022, vol. 55, pp. 5731-5780; R.A. STINE, "*Sentiment analysis*", Annual Review of Statistics and its application, 2019.

[85] EU-OSHA, *LA SSL e il lavoro del futuro: vantaggi e rischi degli strumenti di intelligenza artificiale nei luoghi di lavoro*", *cit*., pp. 7-9.

[86] F. BUTOLLO, U. JURGENS, M. KZRYWDZINSKI, "*From lean production to Industrie 4.0: More autonomy for employees?*", Wissenshanftszentrum Berlin für Socialforschung (WZB) reflection paper, SP 111 2018-303.

This could lead, on the one hand, to a gradual de-skilling of personnel, since specialised skills are required solely to design the training programmes used by workers, and, on the other hand, to work intensification, as assistive devices effectively act as instructors, "forcing" employees to perform tasks with greater speed and precision.

Moreover, additional risks arise from a lack of understanding of the complexity of such technologies, particularly when they are introduced without adequate training or communication with employees.

This issue is particularly pronounced in the context of small enterprises and start-ups, which often adopt innovative technological systems without ensuring compliance with safety regulations, thereby risking the exposure of employees to potential accidents[87].

In this regard, interviews conducted for the *IG Metall Better Work 2020* project revealed that the introduction of robots, worker monitoring, cloud computing, and machine-to-machine communications raises numerous questions regarding the future of work, while trade unionists and companies debate fundamental issues such as the impact of technologies on workload, task complexity, and the levels of stress experienced by employees. The experiences gathered demonstrate that workers experience increasingly high levels of stress when new technologies, as noted above, are implemented without adequate dialogue or sufficient training.

Therefore, the development of specific skills aimed at mitigating the risks associated with the implementation of advanced technologies in the workplace is essential, while ensuring that technological innovation does not compromise the well-being of employees[88].

5.2. The Gig Economy and Artificial Intelligence: an analysis of health and safety risks for digital platform workers.

Before delving into the core issue, namely the examination of health and safety risks to which digital platform workers may be exposed, including as a result of algorithmic systems, it is first necessary to clarify what is meant by a digital platform.

[87] See the statement of Professor Dr Dietmar Reinert, President of PEROSH (*Partnership for European Research in Occupational Safety and Health*), German Social Accident Insurance Institute for Occupational Safety and Health, as provided during the interview with Dr Phoebe V. Morre, on 13 September 2018.

[88] EU-OSHA, *LA SSL e il lavoro del futuro: vantaggi e rischi degli strumenti di intelligenza artificiale nei luoghi di lavoro*", *cit*., pp. 7-9.

When discussing platform work, reference is made to all remunerated activities provided through, or mediated[89] by[90], *digital labour platforms*[91], which connect platform workers with clients and aim to accomplish specific tasks or resolve particular assignments.

These tasks may involve a series of *on-site* activities, such as artisanal work, taxi services, or home deliveries, or be carried out entirely *online*, such as remote programming, translation, graphic design, or online content review.

In order to fully understand the factors related to the health and safety risks to which platform workers are exposed, as well as the issues of prevention and management of these risks, it is useful to construct a three-dimensional taxonomy.

The first dimension concerns the type of work activity, which, although it may be performed either online or on-site, assumes that the matching of workers to clients occurs through the first of these modalities, while the task itself may be executed *on-site* or within a virtual environment, using an electronic device from any location.

From a health and safety perspective, the risks and their management in this context depend on the physical environment in which the work is performed[92]; for example, carrying out a manual task at a client's residence entails different health and safety risks compared to performing a sedentary task at the worker's own home.

The second dimension relates to the level of skill required (which may be low or high) to perform the task. In this regard, factors such as the content, scope, and complexity of the work are considered, as they can have a negative impact on workers' health and safety.

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[89] This form entails the performance of work through the platform in a dematerialised manner, with no physical interaction between the worker and the end client. For example, consider *Amazon's Mechanical Turk* system, where the platform, once it has collected requests for a series of tasks, often repetitive and of limited professional content, assigns them to a pool of individuals willing to perform them, who subsequently submit the completed work through the same platform. Other examples also exist, particularly in cases of fully online activities, such as data coding, text translation, design work, and so forth. G. MAMMONE, "*Intelligenza artificiale e rapporto di lavoro tra robot e gig economy. Ci salveranno i giudici e l'Europa?"*, in LDE, 2023, p. 9.

[90] A digital labour platform is understood here as a "*private company operating on the Internet, acting as an intermediary with more or less extensive supervisory responsibilities, for the provision of an on-demand service requested by individuals or businesses and delivered, directly or indirectly, by individual workers, regardless of whether such service is performed on-site or online*" (cf. the glossary provided during the second phase of consultation with European social partners on the forthcoming Commission initiative aimed at improving working conditions on digital platforms).

[91] In this scenario, the platform acts as the entity responsible for organising the execution of work, insofar as it connects a worker willing to perform a task in a physical space with the individual requesting it. By way of example, consider the delivery of goods or the provision of services facilitated by the *Uber* platform, which operates in the private passenger transport sector through an app that directly connects passengers with drivers. G. MAMMONE, "*Intelligenza artificiale e rapporto di lavoro tra robot e gig economy. Ci salveranno i giudici e l'Europa?"*, *cit*., p. 9.

[92] EU-OSHA "*La tutela dei lavoratori nell'economia delle piattaforme digitali: una panoramica degli sviluppi normativi e politici nell'UE*", in EU-OSHA, 2017.

Moreover, it should be noted that there are often cases in which workers' skills do not appear to match the tasks they are required to perform[93]: for instance, platform workers may carry out low-skilled on-site tasks, such as food delivery, or online tasks, such as image classification (so-called *image tagging*).

The result of all this manifests in feelings of frustration, a lack of motivation, or limited cognitive stimulation. It is also true that some workers are insufficiently prepared to perform the tasks assigned to them, generating stress, for example, platform workers who feel compelled to accept any task for fear that, should they refuse a particular assignment, they will not be selected for future work. Moreover, there is a possibility that such workers are initially unaware of occupational health and safety principles and regulations, having received inadequate training and information.

This can have significant repercussions for risk prevention and management, depriving workers of the ability to correctly assess the inherent risks associated with a particular task, whether performed in a specific physical environment or online, and, consequently, the capability to implement effective control measures and select and use appropriate equipment safely. The third dimension, relating to the level of control (low or high) exercised by the platform, highlights the hierarchical authority and managerial prerogatives regarding the relationship between the platform and its workers, particularly in terms of task assignment, organisation, and performance evaluation.

Specifically, the level of control, on the one hand, provides an indication of the degree of subordination of such workers, as subordination is the legal criterion typically used to determine the nature of the employment relationship and the corresponding occupational health and safety regulations applicable.

On the other hand, it reveals the extent to which platforms rely on algorithmic management, with research indicating a directly proportional relationship between such reliance and the levels of health and safety risk, particularly concerning psychosocial risks to the well-being and mental health of digital platform workers[94].

Against this background, one sector in which AI plays a fundamental role is the so-called gig economy, or "gig work", which relies on digital platforms such as *Uber*, *Upwork*, or *Amazon Mechanical Turk* (AMT).

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[93] CEDEFOP, "*Developing and matching skills in the online platform economy: findings on new forms of digital work and learning from Cedefop's CrowdLearn study*", in Cedefop, 2020; P. BERASTEGUI, "*Exposure to psychosocial risk factors in the gig economy: a systematic review*", in ETUI, 2021.

[94] P. BERASTEGUI, "*Exposure to psychosocial risk factors in the gig economy: a systematic review*", *cit.*

As noted above, these platforms function to connect supply and demand, linking workers with clients via online applications; although not all algorithms deployed in this context utilise AI, it should be noted that data collected from the interactions between clients and workers, including reviews, contribute to updating worker profiles and overall ratings, thereby influencing clients' future choices.

While monitoring and tracking systems are by no means new for couriers and taxi drivers, the recent growth of offline gig workers, such as bicycle *food delivery riders* or *drivers* operating via platforms, represents a more recent development; companies such as *Uber* and *Deliveroo*, for instance, require workers to use specific apps installed on their smartphones, which facilitate activity monitoring through satellite mapping and algorithmic matching technologies.

In this context, AI can offer certain advantages, such as enhancing the safety of drivers and passengers; for example, the Chinese service *DiDi* employs facial recognition to verify drivers' identities and prevent potential fraudulent activity, although this system has its limitations, as demonstrated by a serious incident in which a driver authenticated using his father's identity, with tragic consequences[95].

Gig economy workers, such as delivery riders, operate in an intensive work environment, where objectives are primarily linked to the number of deliveries or customer ratings, often generating pressure, stress, and insecurity; as highlighted in an interview with Harper, new digital tools can become a form of "mental whip", effectively compelling workers to operate more quickly to avoid the risk of losing access to the platform due to low ratings[96]. Such circumstances clearly pose occupational health and safety risks, including psychosocial stress, unfair treatment, and economic insecurity.

In the online *gig economy*, algorithms match clients with workers, as occurs on platforms such as *AMT* or *Upwork*, while certain services, such as *BoonTech*, use advanced technological systems like *IBM Watson AI Personality Insights* to generate tailored connections[97].

[95] EU-OSHA, "*LA SSL e il lavoro del futuro: vantaggi e rischi degli strumenti di intelligenza artificiale nei luoghi di lavoro*", *cit*., pp. 9-10.
[96] THE WEEK, "*The rise of workplace spying*", 2015, in The rise of workplace spying | The Week
[97] EU-OSHA, "*LA SSL e il lavoro del futuro: vantaggi e rischi degli strumenti di intelligenza artificiale nei luoghi di lavoro*", *cit*., pp. 9-11.

However, issues of discrimination must not be overlooked, particularly for women working from home. A study conducted by the ILO reported that many female workers must balance paid work with domestic and care responsibilities, thereby experiencing a dual workload[98].

For instance, in regions such as Africa and Latin America, a significant proportion of women participate in the gig economy, often while caring for young children and working at inconvenient hours, frequently during the night, thereby exposing themselves to potential risks of harassment or work-related violence.

Moreover, the absence of boundaries between domestic life and work, amplified by digitalisation, increases the overall workload, heightening the risks of domestic violence and discrimination[99].

This is an economic activity that tends to quantify every task with extreme precision, with remuneration often limited to the actual time spent, leaving preparatory activities such as skills development or online reputation management unpaid; such a situation, on the one hand, formalises precarious work, since the way these tasks are carried out tends to devalue the legal nature of the employment relationship, characterised by generally insufficient remuneration and excessively long working hours; on the other hand, it normalises worker surveillance, resulting in a predominance of stress and insecurity.

Furthermore, a study[100] emphasises that the gig economy tends to dehumanise work, reducing it to occasional tasks while simultaneously increasing risks such as child labour, racism, and bullying; some workers are compelled to accept more assignments than is sustainable, fearing the loss of access to platforms if they fail to meet client expectations[101].

Although the gig economy offers benefits such as greater flexibility and the potential to reconcile work and personal life, it also entails numerous occupational health and safety risks[102], including the lack of protections, low perceived wages, general insecurity, absence of training, and gender and racial discrimination[103].

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[98] ILO, "*Women spend 100 hours of unpaid care work a week*", in ILO, 2024; ILO, "*Unpaid care work prevents 708 million women from participating in the labour market*", in ILO, 2024.

[99] OIL, "*Ending violence and harassment against women and men in the world of work*", Report V, 107th Session, International Labour Conference, 2018.

[100] P. D'CRUZ, E. NORONHA, "*Positives outweighing negatives: The experiences of Indian crowdsourced workers*", in Work Organisation, Labour and Globalisation, 2016, 10(1), pp. 44-63.

[101] C. FREY, M.A. OSBORNE, "*The future of employment: How susceptible are jobs to computerisation?*", *cit.*, p. 18.

[102] H. HUWS, "*Un'analisi sul futuro del lavoro: le borse del lavoro online o "Crowdsourcing", implicazioni per la salute e la sicurezza sul lavoro*", in Eu-Osha, 2015; C. DEGRYSE,"*Digitalisation of the economy and its impact on labour markets*", Bruxelles, Istituto sindacale europeo, in ETUI, 2016.

[103] M. TAYLOR, "*Good work: The Taylor review of modern working practices*", Department for Business, Energy and Industrial Strategy, Londra, 2017.

These issues are exacerbated by the fact that labour and safety laws have yet to adapt fully to this reality[104], leaving workers without the fundamental protections typical of traditional contracts, such as paid leave, sickness benefits, and union representation, although progress has begun to be made in recent years, as will be discussed in the following chapters.

Therefore, although AI can serve as a tool to improve certain aspects of work, such as identity verification or service personalisation, it is undeniable that the risks inherent in the gig economy demonstrate that the success of these technologies often coincides with a failure to guarantee the rights and safety of the workers operating within it.

Consequently, it is essential to explore appropriate political and regulatory solutions to address emerging challenges and reduce inequalities associated with the digitalisation of work[105].

6. Ethical aspects of Artificial Intelligence: principles, risks, and opportunities for a sustainable and responsible future.

Artificial Intelligence appears to be emerging as one of the most significant challenges humanity will face in the coming decades[106]. While it undoubtedly offers vast opportunities for progress, it also entails substantial risks, particularly concerning the shaping of public opinion and the functioning of democratic systems.

On the one hand, AI has the potential to enhance access to information, foster public debate, promote new forms of participation[107], and contribute to the formation of rational opinions grounded in empirical data; on the other hand, however, it may undermine democratic discourse by negatively influencing electoral processes and distorting the operation of institutions[108].

Despite these potential dangers, as well as those examined in the preceding sections, it is crucial not to reject such technologies altogether; not only can they yield considerable societal benefits, but their widespread diffusion is now driven by powerful global economic and social

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[104] I. WILLIAMS-JIMENEZ, "*Digitalisation and its impact on psychosocial risks regulation*", Documento presentato alla quinta Conferenza internazionale sul lavoro precario e i lavoratori vulnerabili, Londra, Middlesex University, 2016.

[105] EU-OSHA, "*LA SSL e il lavoro del futuro: vantaggi e rischi degli strumenti di intelligenza artificiale nei luoghi di lavoro*", *cit*., pp. 9-11.

[106] G. SARTOR, "*L'intelligenza artificiale e il diritto*", *cit*., p. 84.

[107] P. SAVAGET, T. CHIARINI, S. EVANS, "*Empowering political participation through artificial intelligence*", 2018, 46(3), pp. 369-380, in Empowering political participation through artificial intelligence - PubMed; OECD, "*AI in civic participation and open government*", 2025.

[108] G. SARTOR, "*L'intelligenza artificiale e il diritto*", *cit*., p. 84.

dynamics, making them deeply embedded in the fabric of contemporary life. Consequently, the key challenge lies in steering their deployment towards positive and socially beneficial purposes, while mitigating adverse effects through appropriate policies, regulatory measures, and technical safeguards.

In recent years, the increasing use of AI has sparked intense debate regarding its ethical dimensions and the necessity of effective regulation.

The ethics of AI play an essential role in ensuring that its development and application respect moral values and norms; this field, which falls within the broader discipline of computer ethics, addresses critical issues such as data management, algorithmic decision-making, and associated practices, with the overarching aim of promoting morally sound solutions[109]. This debate has engaged not only the academic community but also private enterprises, political institutions, civil society organisations, and religious communities[110], resulting in the publication of numerous frameworks and guidelines.

A comparative analysis of these ethical principles reveals an emerging global consensus built upon foundational values such as transparency, accountability, non-maleficence, and privacy, frequently accompanied by references to human dignity and solidarity.

Nevertheless, specific policy choices, such as those concerning the use of facial recognition technologies in public spaces, often diverge across cultural contexts and institutional actors[111].

Within the European Union, for instance, documents such as *AI4People*[112] and the *Ethics Guidelines for Trustworthy AI* issued by the *High-Level Expert Group on Artificial Intelligence* have articulated a set of core principles for a trustworthy AI[113]; these include

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[109] L. FLORIDI, M. TADDEO, "*What is data ethics?*", in Philosophical Transactions of the Royal Society, 2016, p. 374. The original text reads as follow: "*branch of ethics that studies and evaluates moral problems related to data (including generation, recording, curation, processing, dissemination, sharing and use), algorithms (including artificial intelligence, artificial agents, machine learning and robots) and corresponding practices (including responsible innovation, programming, hac king and professional codes), in order to formulate and support morally good solutions (e.g. right conducts or right values)*".

[110] F. FOSSA et al., "*Automi e persone*", Carocci, 2021.

[111] L. FLORIDI, "*Etica dell'intelligenza artificiale*", Cortina, 2021.

[112] L. FLORIDI et al., "*AI4People—An Ethical Framework for a Good AI Society: Opportunities, Risks, Principles, and Recommendations*", in Minds and Machines, vol. XXVIII (2018), pp. 689 707; One of the documents outlines the various opportunities that artificial intelligence can offer, such as the potential to enable so-called *human self-realisation* without underestimating human capabilities, the promotion of individual agency, thereby ensuring the retention of human responsibility, and the encouragement of so-called *social cohesion*, thus safeguarding human self-determination.

[113] AI-HLEG, "*Ethics Guidelines for Trust worthy AI*", *European Commission*, 2019; F. HEINTZ et al. (a cura di), "*Trustworthy AI- Integrating Learning, Optimization and Reasoning- First International Workshop*", TAILOR 2020, Virtual Event, September 4-5, 2020, Revised Selected Papers, Springer, 2021.

respect for human autonomy[114], the prevention of harm[115], both substantive and procedural fairness[116], and the explainability of algorithmic decision-making processes[117].

Furthermore, in order to ensure the effective implementation of these principles, seven key requirements have been identified to govern the entire life cycle of an AI system.

These encompass: *human agency and oversight*, which includes respect for fundamental rights and the assurance of meaningful human control; *technical robustness and safety*, encompassing contingency planning, overall security, and an appropriate degree of accuracy, reliability, and reproducibility; *privacy and data governance*, which entails the protection of personal data as well as the preservation of data quality, integrity, and accessibility; *transparency*, comprising traceability, explainability, and clear communication of system operations; *diversity, non-discrimination, and fairness*, which involve the prevention of bias leading to unfair outcomes, the guarantee of accessibility for all users, and the active participation of affected individuals; *societal and environmental well-being*, referring to sustainability, environmental protection, and the broader impact of AI on society and democratic processes; and *accountability*, which requires mechanisms for auditing, minimising, and reporting potential adverse effects arising from the development or deployment of AI systems.

6.1. Towards an ethical use of Artificial Intelligence: data protection, fairness, and transparency in automated decision-making.

Ultimately, three fundamental aspects arising from the impact of AI on society and the world of work must not be overlooked: the protection of personal data, the fairness of algorithmic processes, and the transparency of automated decision-making.

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[114] In this context, human beings engage in a form of interaction with artificial intelligence while simultaneously retaining full and effective self-determination. Accordingly, AI, far from subordinating, coercing, deceiving, manipulating, conditioning, or homogenizing individuals, should be designed to enhance, complement, or augment human capabilities, whether cognitive, social, or cultural.

[115] In this regard, the aim is to safeguard human dignity, as well as physical and psychological integrity. It follows that AI systems and the environments in which they operate must possess a substantial degree of safety and protection, thereby preventing the infliction or exacerbation of harm or any other equally detrimental effects on human beings.

[116] While the substantive dimension entails a commitment to ensuring a fairer distribution of both benefits and burdens, and to safeguarding individuals and groups from bias, discrimination, and stigmatization, the procedural dimension specifically concerns the ability to challenge decisions made by AI systems and the humans who manage them, as well as to seek effective remedies against such decisions.

[117] This principle essentially pertains to the transparency of algorithmic processes, as well as the provision of a clear explanation regarding the capabilities and objectives of AI systems, and the decisions they make, insofar as these directly or indirectly affect individuals' rights.

Indeed, as has been noted repeatedly, although AI is capable of enhancing various aspects of human life, the risks associated with its use nonetheless require critical attention and an appropriate regulatory framework to ensure a balance between benefits and potential harms.
Starting from the first issue, namely the protection of personal data, it must be observed that AI has profoundly transformed the ways in which such data are collected and processed; in an increasingly digitalised environment, every behavior, both *online* and *offline*, can be monitored, recorded, and analysed to generate new insights about individuals. While such processes may prove useful in certain contexts, they can nonetheless endanger personal privacy, as data may be used without the consent of the data subjects or in ways contrary to their legitimate interests.
Hence arises the need to ensure that the use of personal information is both lawful and proportionate, thereby avoiding infringements of fundamental rights, since the absence of direct control over personal data could seriously undermine public trust and raise concerns regarding the ethical and social implications of large-scale data processing.
The second issue, namely the fairness of algorithmic processes, concerns more specifically the risk of discrimination and unequal treatment resulting from the adoption of automated systems designed to analyse and make decisions based on personal data.
In this regard, algorithms, although intended to optimise decision-making processes, can replicate and even amplify the biases inherent in the data on which they are trained; this occurs, for instance, when systems rely on predictive criteria that indirectly favour or disadvantage certain social groups. In such cases, individuals should retain control over their personal data and be entitled to challenge algorithmic decisions affecting them. However, in many situations, they are denied clear explanations as to the rationale underpinning such determinations, thus creating an information asymmetry that undermines their right to fair and transparent treatment.
The third issue, namely the transparency of automated decision-making, is undoubtedly a key component in ensuring the fairness and trustworthiness of AI systems.
In this regard, it is essential that users are placed in a position to understand how and why a particular decision has been made, especially when such a decision produces a significant impact on their lives, such as access to employment, credit, or social benefits.
Nevertheless, many advanced systems, particularly those based on deep learning networks, are characterised by considerable opacity, rendering their internal functioning difficult to explain; this undermines individual autonomy, as people are compelled to interact with

systems that operate as "*black boxes*"[118], the decisions of which are often difficult, if not impossible, to contest.

Moreover, there remains an unresolved tension between the desire for transparency and the efficiency of automated decision-making, insofar as the most complex and effective models are often also the least comprehensible[119].

A further risk associated with AI concerns its capacity to manipulate human behaviour, since AI systems, by virtue of their access to vast amounts of data, are able to influence individual decisions, steering people towards choices that may not align with their genuine interests or preferences.

Such capacity raises serious questions concerning the trust that individuals can reasonably place in AI, as well as the means by which to prevent these systems from exploiting human vulnerabilities: rational trust in AI is essential to ensure that the cognitive capacities of individuals are not manipulated by sophisticated systems endowed with virtually unlimited computational power[120].

For example, digital platforms may condition consumer choices by making certain options less visible or accessible, or by nudging users towards decisions they would not otherwise have made; this phenomenon is linked to practices such as "*filter bubbles*" and "*echo chambers*"[121], whereby the information provided to users is selectively curated to capture their attention or promote specific behaviours, all without their full awareness.

Such dynamics, in addition to constraining individual freedom of choice, can also exert a negative influence on political opinions and decision-making, as exemplified by the *Cambridge Analytica* case.

Finally, AI raises issues related to algorithmic competition and the power imbalances generated by the exclusive control of data and advanced technologies.

In this respect, dominant positions within the digital market may be exploited to restrict consumer options or impose unfavourable conditions, thereby harming not only competitors but also end users.

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[118] F. PASQUALE, "*The black box society: the secret algorithms that control money and information*", Harvard University Press, 2015.

[119] R. GUIDOTTI et al., "*A Survey Of Methods For Explaining Black Box Models*", in ACM Computing Surveys, 2018, vol. LI, n. Article 93, pp. 1-42.

[120] J. M. BALKIN, "*The Three Laws of Robotics in the Age of Big Data*", in OSLJ, 2017, vol. LXXVIII, pp. 1217-241.

[121] E. PARISER, "*The Filter Bubble*", Penguin, 2011.

A notable example is the sanction imposed by the German competition authority on *Facebook*, which was found to have abused its dominant market position by enforcing a unified management of personal data collected across multiple services.

In essence, while AI may indeed offer immense opportunities to enhance various aspects of society, it nonetheless demands responsible governance and appropriate regulation in order to prevent misuse and to ensure that its benefits are distributed equitably.

The protection of data, the fairness of algorithmic processes, and the transparency of automated decision-making, as discussed above, constitute three fundamental pillars upon which the ethical and sustainable use of artificial intelligence must be built.

To achieve such an objective, it is essential to foster a deeper understanding of both the risks and the potential of AI, while simultaneously ensuring that its applications respect the rights and legitimate interests of all individuals concerned[122].

[122] G. SARTOR, "*L'intelligenza artificiale e il diritto*", *cit*., pp. 84-89.

CHAPTER TWO

The EU Regulatory Framework on the Impact of Artificial Intelligence on the Health and Safety of Workers on Digital Platforms.

1. Introduction.

Having laid the necessary groundwork in the preceding chapter, it is first essential to highlight how the phenomenon of digitalisation, beyond the risks previously discussed, can also enhance opportunities for labour market participation and improve the efficiency and standardisation of decision-making processes, thereby reducing subjective discretion. Ù
It can furthermore influence all stages of employment relationship management, from recruitment, through ongoing management, to termination (commonly referred to as algorithmic management).
With regard to workers in particular, these opportunities translate into greater efficiency, inclusivity, and equal opportunities, as well as the personalisation of professional training, active labour policies, and related services. Consequently, the European Union, recognising the importance of a well-regulated development of artificial intelligence across all Member States, pursues two primary objectives: to foster competitiveness, investment, innovation, and market development, and to promote the establishment of a climate of trust (so-called "*trustworthy AI*") in artificial intelligence tools[123].
However, given the increase in employer (or client) powers, amplified by the use of algorithmic tools and AI, there is a clear need to mitigate risks to workers' fundamental rights, which, in this context, are inevitably linked to the exercise of power characterised by opacity and a lack of controllability.
This challenge has been placed at the forefront of the European regulatory Agenda in recent years[124], representing, in a sense, the starting point for the prospects of regulating this

[123] N. ABRIANI, G. SCHNEIDER, "*Diritto delle imprese e intelligenza artificiale. Dalla Fintech alla Corptech*", il Mulino, Bologna, 2021, p. 90. See, also, the strategy, "*L'intelligenza artificiale per l'Europa*", April 25th 2018, COM(2018) 237 def. In particular, scholars have highlighted the use of Article 114 TFEU as the legal basis for the proposed *AI Act*: A ADINOLFI, "*L'intelligenza artificiale tra rischi di violazione dei diritti fondamentali e sostegno della loro promozione: considerazioni sulla (difficile) costruzione di un quadro normativo dell'Unione*", in A. PAJNO, F. DONATI, A. PERRUCCI (a cura di), Intelligenza artificiale e diritto: una rivoluzione? Diritti fondamentali, dati personali e regolazione, vol. I, il Mulino, Bologna, 2022, pp. 127 ss.
[124] In this regard, one may consider the European Commission's initiative, *Shaping Europe's Digital Future* (2020), subsequently reinforced by the Commission Communication *Digital Compass 2030: the European*

phenomenon and giving rise to a new era of European regulation, sometimes referred to as the "*New European Constitutionalism*"[125].

A first concrete initiative was the so-called *White Paper on Artificial Intelligence*, presented by the European Commission in February 2020, which, with a view to designing an effective regulatory perspective in the AI sector, identified seven parameters aimed at the orderly development of automated systems. These parameters encompass human intervention and oversight, technical robustness and safety, data privacy and governance, transparency, diversity, non-discrimination and fairness, social and environmental well-being, and accountability.

It is worth noting that these criteria are translated, in different ways, into a wide array of regulatory measures[126], adopted in accordance with a regulatory approach with objectives that are distinct yet complementary. However, this multiplicity of interventions may result in a limited effectiveness of protections compared with what could be ensured under a single, coherent regulatory framework, such as the establishment of a universal statute aimed at providing full and effective protection for individuals performing work in the age of AI.

Even in the presence of such heterogeneity in these regulatory interventions, it is still possible to discern a common methodological thread.

In this regard, two complementary regulations may be considered by way of example, namely the *Digital Services Act*[127] and the *Digital Markets Act*[128], through which, in order to mitigate the risks arising from the immense power enjoyed by the major companies operating online platforms, a risk-based preventive approach has been adopted[129].

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model for the digital decade (March 2021, COM(2021)118 final), as well as by the *European Declaration on Digital Rights and Principles for the Digital Decade* (January 2022, COM(2022)28 final); see also A. ALAIMO, "*Lavoro e piattaforme tra subordinazione e autonomia: la modulazione delle tutele nella proposta della Commissione europea*", in DRI, 2022, n. 2, pp. 639 ss.

[125] V. DE STEFANO, "*The EU Commission's proposal for a Directive on Platform Work: an overview*", in ILLEJ, 2022, n. 1, p. 2.

[126] Member States are pointing at the current absence of a common European framework. The German Data Ethics Commission has called for a five-level risk-based system of regulation that would go from no regulation for the most innocuous AI systems to a complete ban for the most dangerous ones. Denmark has just launched the prototype of a Data Ethics Seal. Malta has introduced a voluntary certification system for AI. If the EU fails to provide an EU-wide approach, there is a real risk of fragmentation in the internal market, which would undermine the objectives of trust, legal certainty and market uptake.

[127] EU Regulation 2022/2065 of the European Parliament and of the Council of 19 October 2022 on the establishment of a single market for digital services, amending Directive 2000/31/EC (*Digital Services Act*).

[128] EU Regulation 2022/1925 of the European Parliament and of the Council of 14 September 2022 on fair and contestable markets in the digital sector, amending Directives (EU) 2019/1937 and (EU) 2020/1828 (*Digital Markets Act*).

[129] G. DE GREGORIO, P. DUNN, "*The European Risk-Based Approaches: Connecting Constitutional Dots in the Digital Age*", in Common Market Law Review, 2022, vol. 59, n. 2, pp. 473 ss.

Indeed, in accordance with the aforementioned principle of accountability and with respect to those platform activities that provide intermediary, information, or personal data management services, certain procedural safeguards have been established, primarily concerning duties of transparency and supervision, disclosure, monitoring, and risk assessment, thereby replicating, in a sense, the methodology already implemented by the *GDPR*.

Accordingly, the legislation to be examined in order to address effectively the issue of AI applied to occupational health and safety comprises the adoption of Regulations (as in the case of the *GDPR* and the *AI Act*), which, pursuant to article 288 TFEU, are legal acts of general application, binding in their entirety, and directly applicable in all EU Member States. In addition, Directives are also relevant instruments (for example, those concerning working conditions in the context of digital platforms), which, pursuant to the aforementioned article 288 TFEU, are adopted by EU institutions in accordance with the Treaties and bind the Member State(s) concerned as regards the result to be achieved, leaving the national authorities the power to choose the form and means to attain that objective. Consequently, unlike a Regulation, a Directive is not directly applicable in Member States, as it must first be transposed into national law[130].

The adoption of these types of acts follows two possible procedural routes, as provided for in Articles 289 et seq. TFEU, namely the ordinary procedure, which, pursuant to paragraph 1 of Article 289, consists of the joint adoption of a Regulation, Directive, or Decision by the European Parliament and the Council on a proposal from the Commission, and the special procedure, provided for in paragraph 2 of the same Article, which, in specific cases envisaged by the Treaties, results in the adoption of a Regulation, Directive, or Decision by the European Parliament with the participation of the Council or by the Council with the participation of the European Parliament[131].

The White Paper on AI should not be overlooked, which, in general terms, is a document containing proposed courses of action for the EU in a given sector, with the aim of initiating a discussion with the public, stakeholders, the European Parliament, and the Council in order to achieve political consensus[132].

2. Algorithmic Management and the protection of digital platform workers' rights: foundations for constructing an effective european regulatory framework.

[130] See, Directive - EUR-Lex.
[131] See, Il diritto derivato dell'Unione europea | EUR-Lex.
[132] See, White paper - EUR-Lex.

In order to reconstruct effectively the European regulatory framework on this matter, it should be emphasised that, to address optimally the risks arising from algorithmic management, it is essential to adopt a preventive perspective, which is better suited to ensuring the most effective protection of fundamental rights within the context of digitalisation[133]. In this regard, faced with the challenges posed by the opacity and particular intrusiveness of automated systems used in the management of employment relationships, the effectiveness of safeguards can be guaranteed through an approach that, on the one hand, focuses on the prevention of risks at their root (commonly referred to as *risk-based*), and, on the other hand, aims at the design and implementation of such systems in accordance with the so-called *human-centred* principle, through mechanisms of human oversight and review, the right to prior information, data protection, and non-discrimination.

It is clear that such an approach seeks to address, at its root, the opacity inherent in the exercise of power mediated by new technological tools; while the final outcome in such systems represents the result of a series of decisions taken during their design, it follows that regulation, far from being limited to the moment of decision-making, must also extend to the genetic phase of the construction of algorithmic systems, within which the managerial authority of human decision-makers is concentrated[134].

Finally, it should be noted that the above approach is aligned with the *European Social Pillar*, which could enhance the sense of responsibility among employers and clients who utilise these systems, adopting, among other measures, a general application approach, which, insofar as it directly concerns the protection of the fundamental rights to freedom and dignity of workers, warrants universal application, regardless of the actual exercise of managerial powers by enterprises employing automated systems via platforms[135].

2.1. ***Introduction to safeguards concerning human oversight and transparency in the use of automated systems.***

Building on the premise outlined in the preceding paragraph, it has been observed that one of the two cornerstones of the innovative approach the EU intends to adopt lies, from a

[133] In this regard, see A. TOPO, "*Nuove tecnologie e discriminazioni*", Report to the 21st National Congress of AIDLaSS, Messina, 2024, p. 22.

[134] M. DEL FRATE, "*Tra gli ingranaggi dell'algoritmo, la chiave del lavoro tramite piattaforme digitali*", in DRI, 2022, n. 2, p. 671.

[135] P. DE PETRIS, "*Lavoro e piattaforme digitali. Qualificazione, poteri e tutele*", Giappichelli, Torino, 2025, pp. 83-86.

substantive perspective, in the principles of human oversight and transparency, considered as starting points for establishing a system of safeguards for fundamental rights in response to the risks of adverse impacts arising from the improper use of algorithmic systems[136].

These two criteria are, in fact, closely interrelated.

With respect to the dimension of risk governance, human oversight is designed to ensure a certain level of algorithmic reliability, including aspects of comprehensibility and explainability. Regarding the dimension of human involvement, it is essential to emphasise that effective human intervention cannot occur without a proper understanding of the underlying processes and outcomes of algorithmic systems[137].

These parameters first emerged from the work of expert groups on artificial intelligence and the *Guidelines for Trustworthy AI in the EU*[138], as well as from European Commission policy documents, such as the so-called *White Paper on AI*[139], and the European framework agreement on digitalisation negotiated by the social partners at EU level[140]. They are further

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[136] This perspective is likewise shared by the Council of Europe, as in September 2019 the Committee of Ministers established a dedicated Committee on Artificial Intelligence (CAHAI) with the purpose of identifying and evaluating, through consultation with various stakeholders, the factors contributing to the creation of a legal framework for the development, design, and application of AI. The starting point for this framework is provided by the Council of Europe's own standards concerning human rights, democracy, and the rule of law. In particular, the document presented by CAHAI in 2021 highlights that the concepts of "*transparency*", "*explainability*", and "*accountability*" constitute elements of considerable significance for the protection of individual rights within the context of AI systems (para. 30). It is further noted that the establishment of a cross-cutting and legally binding instrument should incorporate provisions designed to ensure a level, albeit minimal but necessary, of human oversight over AI systems and their effects (para. 31) (Council of Europe, Ad hoc Committee on Artificial Intelligence, CAHAI, *Possible Elements of a Legal Framework on Artificial Intelligence, Based on the Council of Europe's Standards on Human Rights, Democracy and the Rule of Law*, Strasbourg, 3 December 2021, CAHAI (2021)09 rev).

[137] M. PERUZZI, "*Intelligenza artificiale e lavoro. Uno studio su poteri datoriali e tecniche di tutela*", Torino, Giappichelli, 2023, p. 35.

[138] European Commission, Directorate-General for Communications Networks, Content and Technology, *Ethics Guidelines for Trustworthy AI*, Publications Office of the European Union, 2019.

[139] EUROPEAN COMMISSION, "*White Paper on Artificial Intelligence – A European Approach to Excellence and Trust, Brussels*", 19 February 2020, COM(2020) 65 final.
In this document, the need to establish regulatory instruments that are both effective and supplementary to sector-specific legislation was emphasised, with the aim of mitigating errors and distortions arising from the potential misuse of systems employing artificial intelligence. In particular, the aforementioned White Paper seeks to prescribe regulatory measures designed to prevent risks that may compromise fundamental rights, privacy, and personal data, as well as user safety and the correct allocation of legal responsibilities, including risks that may give rise to discriminatory treatment (A.A.V.V., "*Study to support an impact assessment of Regulatory requirements for Artifical Intelligence in Europe*", EU Commission DG Connect, Aprile 2021).

[140] Ces-Businesseurope-SMEunited-Ceep, "*Accordo quadro europeo sulla digitalizzazione*", June 22th 2020.
The aforementioned agreement largely addresses the issues of human oversight and transparency, incorporating the latter within the framework dedicated to ensuring the principle of human control. It is specifically stated therein that "*human oversight of machines and artificial intelligence must be guaranteed in the workplace and should support the use of robotics and AI applications, in compliance with safety controls*." Moreover, the utility of such oversight lies, for example, in preventing the erroneous application of AI, particularly in contexts where AI is employed in human resources procedures, such as recruitment, performance evaluation, promotion, and dismissal, as well as in safeguarding transparency through the provision of information. Furthermore, the worker concerned may submit a request for intervention and may challenge automated decisions, including requesting verification of the results produced by the AI.

reflected in the *AI Regulation*, the *Directive on work via digital platforms*, and the *European Declaration on Digital Rights* and *Principles for the Digital Decade*, adopted by the European Parliament, the Council, and the Commission on 15 December 2022[141].

Although the two safeguards, human oversight and transparency, common to all the aforementioned documents represent focal points in the construction of a robust regulatory framework for AI, it should be noted that, particularly in relation to the protection of platform workers, they are linked to a conception of AI that, far from recognising autonomous legal capacity for technological tools, assigns primary responsibility to human actors[142], through the establishment of effective management processes designed to prevent risks of rights violations.

Conversely, there is a clear need to ensure the effectiveness of such rights against the opacity of algorithmic systems, through processes that enable the identification and traceability of potential violations.

In order to fully comprehend the salient features of these safeguards, it is useful to briefly examine the documentation underpinning the AI Act.

Firstly, human oversight, as outlined at point 65 of the *Ethics Guidelines for Trustworthy AI*, may be implemented through various governance mechanisms. These include the so-called *human-in-the-loop* (HITL) approach, which entails the (not always feasible) presence of human control at every decision-making stage of the system[143] and the *human-on-the-loop* (HOTL) approach, which focuses on human involvement in system design and in the monitoring of its operation, and, lastly, the *human-in-command* or *human-in-control* (HIC) approach, which centres on more general oversight, including economic, ethical, legal, and

[141] Within the context of this Declaration, one can discern a commitment both to ensuring human oversight in the making of significant decisions affecting workers and to guaranteeing human supervision, insofar as algorithmic systems are employed, over outcomes that concern the safety and fundamental rights of individuals. Furthermore, the Declaration upholds the principle of transparency regarding the use of algorithms and AI, thereby enabling individuals to exercise autonomy and responsibility in their proper utilisation, and to receive information concerning their interaction with such systems. Finally, it guarantees transparency in the deployment of AI within the workplace, adopting a risk-based approach in order to implement effective preventive measures aimed at maintaining a safe and healthy working environment.

[142] N. ABRIANI, G. SCHNEIDER, "*Diritto delle imprese e intelligenza artificiale. Dalla Fintech alla Corptech*", *cit.*, pp. 47-48.

[143] M.L. JONES, "*The right to a human in the loop: Political constructions of computer automation and personhood*", 2017, 47(2), pp. 216 ss, in The right to a human in the loop: Political constructions of computer automation and personhood - Meg Leta Jones, 2017.; B. WAGNER, "*Liable, but not in control? Ensuring meaningful human agency in automated decision-making systems*", in Policy Internet, 2019, 11(1), pp. 104 ss.

social impacts, over the AI system's activity, as well as the ability to determine when and how the system should be used in particular situations[144].

It should also be noted that, in cases of limited human oversight of an AI system, a more rigorous control mechanism becomes increasingly essential, highlighting the dual level (system operation and managerial oversight) at which such a safeguard operates.

In the *White Paper on AI*, this safeguard is primarily manifested within the human-in-command model, particularly in relation to human review and validation, which serves to apply the system's output effectively, and in the ex post intervention safeguard, whereby monitoring enables timely human action in the event of system malfunction[145].

Similar considerations apply to the principle of transparency.

At point 75 of the aforementioned *Ethics Guidelines*, this safeguard is closely associated with the principle of "*explainability*" and encompasses transparency regarding the elements that constitute an AI system, namely the data, the system itself, and the business models. Further guarantees linked to this principle include "*traceability*" (point 76), which involves documenting the full set of data and processes, including data collection and labelling, as well as the algorithms employed in producing the system's decisions, "*explainability*" (point 77) of the system's technical processes and related human decisions, and "*communication*", which entails full identifiability of the system and the option to interact with a human operator.

Here too, the *White Paper* plays a significant role, focusing on the obligation to provide information regarding the capabilities and limitations of AI systems, "*in particular with respect to the purpose for which the systems were designed, the conditions under which they can be expected to perform as intended, and the level of accuracy anticipated in achieving the specified objective. Such information is particularly important for those who operate the systems, but may also be relevant for competent authorities and other stakeholders*" (para. 5, Section D, letter c).

2.2. ***Methodological considerations: the risk-based approach.***

[144] C. CASONATO, B. MARCHETTI, "*Prime osservazioni sulla Proposta di Regolamento dell'Unione europea in materia di intelligenza artificiale*", in BioLaw Journal, 2021, 3, pp. 420 ss.; S. AMATO, "*Biodiritto 4.0 Intelligenza artificiale e nuove tecnologie*", Giappichelli, Torino, 2020.

[145] U. RUFFOLO, A. AMIDEI, "*La regolazione ex ante dell'intelligenza artificiale tra gestione del rischio by design, strumenti di certificazione preventiva e "autodisciplina" di settore*", in A. PAJNO, F. DONATI, A. PERRUCCI (a cura di), Intelligenza artificiale e diritto: una rivoluzione? Diritti fondamentali, dati personali e regolazione, vol. I, il Mulino, Bologna, 2022, pp. 489 ss.

The second dimension, namely the risk-based approach, which, as previously described, represents a kind of guiding thread governing the divergences that characterise the regulatory measures addressing the seven requirements outlined in the White Paper on AI, is, instead, the expression of a precise methodological choice, which, enacted at the EU level and implemented to ensure a more efficient regulation of AI, aligns primarily with the previously described *human-in-command* model, encompassing both the level of supervision regarding human involvement within the automated process and, more generally, oversight of the organisation and management of the AI systems employed[146].

Indeed, drawing on the White Paper, in particular paragraph 4, Section C, the Commission recognised the necessity of a risk-focused approach, so as to guarantee a certain degree of proportionality in regulatory intervention.

Moreover, in the Framework Agreement adopted by the social partners in June 2020, the need for a risk assessment in relation to the use of various AI systems was evaluated, encompassing all measures aimed at safeguarding health and safety, thereby preventing potential harmful events affecting physical integrity, psychological safety, biases, and cognitive fatigue.

It should be noted, furthermore, that in the European Parliament Resolution of October 2020, regulations concerning AI systems are required to follow a risk-based approach, utilising the existing toolkit (including the list related to *GDPR* impact assessment[147]), which entails that the asymmetry between those who operate these systems and those who interact with and are subject to them must be mitigated through the adoption of a robust regulatory framework aimed at ensuring that the aforementioned AI systems, in addition to complying with EU law, are also consistent with the precautionary principle governing EU legislation (paragraph 3 of the Resolution).

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[146] In this renard, see E. DAGNINO, "*Dalla fisica all'algoritmo: una prospettiva di analisi giuslavoristica*", ADAPT University Press, 2019, p. 199; it is explicitly highlighted that "*to address the challenges posed by artificial intelligence, the so-called human-in-command approach has been proposed by multiple actors as a 'precondition for the sustainable development' of algorithmic systems. This approach is founded on the necessity for human beings to retain control over the actions carried out by machines and to intervene in the decisions adopted through algorithms. It entails that humans must remain the active agents and, as such, bear responsibility for the implementation of the various applications of artificial intelligence across all its different stages*".

[147] EUROPEAN PARLIAMENT, "*Resolution of 20 October 2020 containing recommendations to the Commission on a regulatory framework addressing the ethical aspects of artificial intelligence, robotics and related technologies*", in European Parliament, 2020/2012 (INL), paras. 12 and 16.

Drawing on these documents, scholarship[148] has emphasised that the challenges posed by AI can be addressed through the combination of principles that, while alternative, are not mutually incompatible: namely, risk assessment and precaution.

The latter, in fact, entails a prohibition or restriction on the use of a particular technological system and is considered where the application of such a system may potentially generate risks of considerable severity, especially when these risks cannot be precisely calculated in advance, even through an appropriate risk assessment, due to the lack of specific knowledge regarding the magnitude of potential negative consequences[149].

Analysed from this perspective, it is possible to highlight how the risk-based approach provides mechanisms that can readily adapt to emerging sources of hazard, as well as the operationalisation of human supervision for the classification of such hazards and the prior proceduralisation of operator conduct[150], all in light of the principle of accountability, which underpins effective risk management.

This entails that the automation characterising certain AI systems does not exempt actors such as developers, producers, service providers, owners, and operators from potential liabilities arising from the consequences of decisions made through such systems[151].

Furthermore, it should be noted that neither the accompanying report to the AI Regulation[152] nor the Regulation itself (the *AI Act*) contains any explicit reference to the precautionary principle.

What emerges, rather, is a risk-focused approach that is considerably more rigid than that employed under the GDPR[153]; in particular, it should be noted in advance that the *AI Act*

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[148] A. ROTA, "*Sicurezza*", in M. NOVELLA – P. TULLINI, Lavoro digitale, Giappichelli, Torino, 2022, pp. 83 ss.; G. NATULLO, "*Ambiente di lavoro e tutela della salute*", Giappichelli, Torino, 2020.

[149] COMMISSIONE EUROPEA, "*Comunicazione sul principio di precauzione*", in Eur-lex, 2 febbraio 2000, COM(2000)1.

[150] N. ABRIANI, G. SCHENEIDER, "*Diritto delle imprese e intelligenza artificiale. Dalla Fintech alla Corptech*", *cit*., pp. 109, 112, 118.

[151] A. MANTELERO, "*Beyond Data: human Rights, Ethical and Social Impact Assessment in AI*", Springer, The Hague, 2022.

[152] In this Report, at paragraph 1.1, the Commission asserts that the regulatory framework in question is well-proportioned and focused on a robust, risk-based approach, which, moreover, does not impose restrictions on trade; it follows that the legal intervention is tailored to the specific situations as they arise, in respect of which justified concerns may emerge or be anticipated in the future. Additionally, the legal framework encompasses all those flexible mechanisms that enable it to be adapted in response to technological developments and the emergence of new circumstances that may give rise to concern.

[153] In this regard, whereas the GDPR affords the data controller a greater degree of autonomy, taking due account of the context in which they operate, the *AI Act*, by contrast, is characterised by a level of rigidity inherent in its risk-based approach, which leaves little room for the provider to exercise discretion in practical terms. This perspective has, in turn, led to the development of the so-called regulatory sandboxes, provided that there is collaboration among various stakeholders in the definition of the rules, thereby promoting both compliance with the regulatory framework and the dissemination of potential innovative ideas. See O. POLLICINO, G. DE GREGORIO, "*Intelligenza artificiale, data protection e responsabilità*", in A. PAJNO, F. DONATI, A.

categorises AI systems from the outset into three risk levels: unacceptable, high, and low/minimal, accompanied by the explicit provisions set out in article 5 concerning prohibited practices, which are subsumed under the first of these categories.

With regard to systems classified as "*high-risk*", pursuant to article 6 of the Regulation, it should be observed that the risk-based approach is articulated within a regulatory framework structured across three distinct levels: the risk assessment and management level, which, in accordance with article 9, encompasses the stages of identification, evaluation, and mitigation of risks; the quality management system level, which, pursuant to article 17, in addition to incorporating the first level, also encompasses the accountability framework and conformity self-assessment, the latter of which, under articles 19 and 43, is predicated upon verification of the quality management system of AI systems.

The salient feature of this regulatory architecture lies in the fact that the obligation is incumbent upon the provider rather than the user; furthermore, as the framework is to be applied in all circumstances deemed "*high-risk*" from the outset, the emphasis is placed primarily upon risk mitigation rather than estimation[154].

Ultimately, the risk-based approach also assumes a prominent role within the *European Declaration on Digital Rights and Principles*, being highlighted both in relation to the deployment of AI systems within the workplace and the imperative to ensure measures which maintain a safe and healthy working environment[155].

Prior to a detailed examination of the protections afforded by the individual instruments, namely, the *GDPR*, the AI Act, and the *Directive on platform work*, it is pertinent, in light of the preliminary review of safeguards designed to protect the rights of workers subject to algorithmic management, to clarify that the *AI Act* embodies a horizontal approach. In this respect, whilst its guarantees are of particular significance, especially given that they are not confined solely to the application of AI within employment contexts, it is crucial to note that such provisions must be coherently aligned and integrated with other regulatory instruments in order to furnish robust protection against the specific risks associated with AI systems.

Specifically, such alignment may be effected with regulatory frameworks pertaining to the protections established under the *GDPR* (*de iure condito* perspective, which serves as the

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PERRUCCI (a cura di), Intelligenza artificiale e diritto: una rivoluzione? Amministrazione, responsabilità, giurisdizione, vol. II, il Mulino, Bologna, 2022, p. 354.

[154] A. MANTELERO, "*Beyond Data: human Rights, Ethical and Social Impact Assessment in AI*", *cit*., p. 169.

[155] M. PERUZZI, "*Intelligenza artificiale e lavoro. Uno studio su poteri datoriali e tecniche di tutela*", *cit*., p. 40.

point of departure) and the *Directive on work via digital platforms* (*de iure condendo* perspective, which, it should be emphasised, encompasses the *AI Act* itself)[156].

3. Safeguarding the Rights of Platform Workers in the Context of Algorithmic Management and the GDPR.

Continuing the analysis centred on the risk-based approach, it is first necessary to highlight that the challenges associated with algorithmic management, essentially grounded, as noted in the preceding chapter, on the collection and use of data relating to workers (the so-called *Big Data*), can initially be traced to a lack of transparency concerning the modalities of data processing. Such opacity stands in clear contrast with the provisions set forth in the General Data Protection Regulation (*GDPR*)[157].

To begin with, it must be clarified that, as a general rule, data processing activities must be conducted in accordance with the principles of transparency and fairness, in line with the logic of *accountability,* enshrined in article 5(2) of the *GDPR*; this principle, which replaced the former *authorisation-based* model under Directive 95/46/EC[158], requires data controllers to be demonstrably responsible for compliance.

In the employment context, this implies that the employer must be able to prove the adoption of all appropriate technical and organisational measures to safeguard personal data, including, by way of example, the principles of *privacy by design* and *privacy by default*, as well as the data protection impact assessment (*DPIA*) provided for in Articles 25 and 35 of the *GDPR*[159]**.**

Accordingly, the *GDPR* aims to ensure that workers operating on digital platforms enjoy a comprehensive set of rights relating to the processing of their personal data. Among these are the right to be informed about the methods, purposes and actors involved in the processing of their data, who, in turn, are subject to corresponding obligations, as well as the right of access and to obtain a copy of such data.

In addition, workers have the right to rectification and completion in cases of inaccuracy or incompleteness, the right to erasure or deletion, and the right to restrict or limit the use of

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[156] C. SPINELLI, "*Digitalizzazione, trasparenza e sistema di relazioni industriali nel prisma della regolazione sovranazionale*", in DRI, 2025, 1, forthcoming.

[157] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (OJ L 119, 4.5.2016, pp. 1-88).

[158] A. INGRAO, "*Controllo a distanza e privacy del lavoratore alla luce dei principi di finalità e proporzionalità della sorveglianza*", in LLI, 2023, vol. 9, 1, p. 107.

[159] G. FINOCCHIARO, "*Introduzione al regolamento europeo sulla protezione dei dati*", in Nuove leggi civili commentate, p. 10.

their data. They also retain the right to object to processing, to avoid being subjected to automated decision-making processes that produce legal or similarly significant effects without meaningful human involvement, and to receive clear information on the logic, rationale and anticipated consequences of data processing operations.

This framework thus underscores the pivotal role of transparency and human oversight as essential safeguards in mitigating the risks inherent in algorithmic management within digital labour platforms.

Digital labour platforms, by virtue of the sophisticated technologies at their disposal, possess the capacity to collect an extensive volume of data concerning transactions, intermediary platforms, and their platform workers (with the exception of clients). Such data collection also encompasses personal data relating to the workers themselves, defined as "*any information through which workers may be identified directly or indirectly, for instance, their name, identification number, location data, and other factors pertaining to their physical, psychological, or economic identity*".

In this regard, the *GDPR*, given its broad material scope over personal data, may play a particularly significant role in rebalancing the asymmetrical power relations between platforms and their workers.

Within the present context, particular emphasis must be placed upon the right of platform workers not to be subject to decisions based solely on automated processing, including profiling, where such decisions produce legal or similarly significant effects, these latter being understood as factors capable of affecting the worker's status or contractual rights, or otherwise constraining their use of the platform.

This right, however, is not absolute; it cannot be exercised where automated decision-making is deemed "*essential for the entering into or performance of a contract between the platform worker and the platform*" (article 22 (para. 2)(a) *GDPR*), or where it "*is based on the explicit consent of platform worker*" (article 22 (para. 2)(c) *GDPR*).

Nevertheless, in practice, the structural imbalance of power, arising, quite evidently, from the divergent contractual positions of platforms and workers, often results in workers being, to some extent, compelled to provide their consent to data processing.

Similarly, the absence of human oversight is frequently justified by reference to the sheer volume of data to be processed, although, in such cases, platforms remain under an obligation to assess the feasibility of alternative methods and to establish appropriate safeguards.

Moreover, articles 13, 14, and 15 *GDPR* warrant particular consideration, as they enshrine the right to information, including "*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".

In this respect, the *GDPR* serves to reinforce the right of digital platform workers to obtain an explanation concerning the use of their personal data; this, in turn, entails a corresponding duty on the part of platforms to provide workers with general yet sufficiently detailed information that may prove instrumental, for instance, in contesting a decision made in relation to them.

Taken as a whole, this framework underscores the imperative of transparency and human accountability in the governance of algorithmic management systems, ensuring that technological efficiency does not eclipse the protection of fundamental rights and the worker's dignity in the digital age.

Indeed, in line with the guidelines issued by the article 29 *Data Protection Working Party* (the effective implementation of which requires serious commitment from platforms), platform workers may challenge such decisions or express their views, provided they are fully able to comprehend how, and on what grounds, these decisions were taken[160]. Fundamentally, the *GDPR* (articles 13, 14, 15, and 22)[161], considered alongside Recitals 63[162] and 71[163] and the

[160] EUROPEAN COMMISSION, "*White Paper on Artificial Intelligence – A European Approach to Excellence and Trust, Brussels*", *cit*.

[161] In particular, articles 13 and 14 GDPR enshrine two distinct yet profoundly significant principles, given their capacity to render the principle of algorithmic transparency more tangible. On the one hand, the so-called "*principle of accessibility*" seeks to inform the data subject, an obligation incumbent upon the data controller, of the existence of any automated decision-making process concerning their personal data. On the other hand, the so-called "*principle of comprehensibility*" operationalises the principle of accessibility, insofar as its objective is to provide the data subject with a clear explanation of the mechanisms underpinning the algorithm on which a given decision is based (A.D. SELBST, J. POWLES, "*Meaningful information and the right to explanation*", in IDPL, 2017, pp. 233 ss.). In light of the foregoing, it is evident that the capacity to fully comprehend the algorithmic logic can only be realised where there exists a certain affinity between the logical processes employed by the technological tool and those typically utilised by the human operator, failing which the former risks being incomprehensible. Equally significant is Article 15 GDPR, which, alongside the two provisions analysed above, makes a substantial contribution to safeguarding the data subject's right to information (C. COLAPIETRO, "*Circolazione dei dati, automatizzazione e regolazione*", in Osservatoriosullefonti.it., 2021, n. 2, p. 837), Providing for the so-called "*right of access*", which consists of affording the recipient of an algorithmic decision the opportunity to ascertain both the data utilised in the processing and the very existence of an automated decision-making procedure concerning such data. In this regard, it is important to immediately highlight the distinction between the scope of article 15 and that of articles 13 and 14: whilst the latter pertain to a stage prior to the commencement of processing, limiting the request for information to the data and processes in operation at that particular moment, Article 15, by contrast, applies subsequent to the initiation of processing, thereby justifying a request for additional and distinct information from that envisaged under Articles 13 and 14, which may, however, coincide with information concerning, for instance, new data generated by the algorithm or information regarding the functioning of the algorithm at the time of the request, confined to "*what is legally necessary to safeguard the individual within a process of technological hetero-determination of their identity*" (R. MESSINETTI, "*La tutela della persona umana versus l'Intelligenza Artificiale. Potere decisionale dell'apparato tecnologico e diritto alla spiegazione della decisione automatizzata*", in CI, 2019, n. 2, p. 885).

article 29 *Working Party guidelines*, clearly establishes the worker's right to access information on the logic underpinning automated decision-making, both in terms of the *ex ante* comprehensibility of its operation and the ex post explainability of decisions, forming a prerequisite for exercising the right to object and request review by the human operator under article 22[164]. This provision confers upon workers a range of rights in relation to the risks of algorithmic opacity and the so-called "*zero-knowledge proof*"[165] risks inherent to such systems; these include *human oversight* of algorithms and intelligent systems[166], *transparency*[167] (which supports non-discrimination), insight into computational processes (to mitigate knowledge asymmetries), and *accountability* for system operations, including the right to review automated processing of their data.

It is evident that this approach aligns fully with the European strategy for "*human-centric*"[168] AI, as proposed by the European Commission, whereby AI, under proper human oversight, is made as reliable as possible while upholding fundamental values such as dignity, freedom, and equality.

Notably, the principle of oversight may, according to the Commission, be implemented through governance mechanisms ensuring direct human intervention (*human-in-the-loop*), human supervision (*human-on-the-loop*), or full human control (*human-in-command*), each capable of replacing, rectifying, or even annulling an algorithmic decision with a human one. Such mechanisms prove undeniably useful insofar as the data employed by AI tools may give

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[162] It essentially concerns the right, accorded to the data subject, to obtain information regarding the "*logic underpinning any automated processing of data and, at least where it is based on profiling, the potential consequences of such processing*".

[163] It establishes the data subject's right to obtain, through the so-called "*principle of explainability*", an elucidation regarding a particular algorithmic decision. This operation transcends the mere understanding of the algorithmic logic, as it entails a full and rational comprehension, by any observer, of the decision itself and the underlying reasons. It should be clarified, moreover, that this principle, being a Consideration with strictly interpretative value and not carrying any binding force, may nonetheless be invoked to impose additional obligations on the data controller beyond those derived from the "*principle of comprehensibility*", insofar as the latter is insufficient to ensure a proper balance between the interests relating to the use of an algorithm and the protection of the data subject. In essence, it does not constitute a general obligation incumbent upon the data controller, but rather a specific one, applicable following the assessment of the concrete case, and operative in a residual manner, that is, where the principles already established to safeguard the data subject prove inadequate.

[164] U. PAGALLO, "*Algoritmi e conoscibilità*", in RFD, 2020, 93.

[165] COUNCIL OF EUROPE, "*Algorithms and Human Right, Study on the human rights dimensions of automated data processing techniques and possible regulatory implications*", in Council of Europe, 2018.

[166] M. FAIOLI, "*Mansioni e macchine intelligenti*", Giappichelli, Torino, 2018.

[167] See, in this regard, article 13 of the proposed Regulation under COM(2021) 206 final, which establishes the obligation of transparency and information, thereby enabling users to correctly interpret and utilise the outcomes produced by the system.

[168] In this regard, COM(2019) 168 final of 8 April 2019, "*Building Trust in Human-Centric Artificial Intelligence*", in Eur-lex.

rise to errors, or lead to decisions that are discriminatory or that result in intolerable inequalities.

This issue is connected to the problem of opacity inherent in artificial intelligence systems based on machine learning and, in particular, deep learning, giving rise to the phenomenon known as the 'black box', in response to which the field of so-called explainable AI has developed. Such systems operate through a procedural process that begins with the analysis of data, aimed at identifying correlations and statistical patterns that enable the generation of increasingly effective outputs. However, the difficulty in reconstructing and interpreting the correlations created within neural networks makes it challenging to understand the decision-making process that leads to the final outcome. Indeed, when assessing the adequacy of anti-discrimination law in relation to such systems, it emerges that certain traditional categories, such as associative, indirect and intersectional discrimination, are already grounded in concepts of association and correlation. Nevertheless, these instruments do not appear to be sufficient to effectively address the risks arising from algorithmic opacity. In particular, the difficulty in understanding the decision-making process makes it more complex to identify disparities in treatment, especially where victims are not immediately identifiable or aware of the prejudice suffered, and where clear comparators are lacking. Further challenges stem from the fact that machine learning systems may generate unpredictable correlations capable of producing indirect and difficult-to-detect discriminatory effects. This also has negative implications at the evidentiary level, making it more difficult to establish the existence of discrimination in judicial proceedings, both for workers and for employers[169].

When translating article 22 into an employment law context, it is important to emphasise that its purpose is to ensure human oversight of decisions made by algorithmic tools; this requires, in the first instance, clarification of the procedures by which such oversight is operationalised within employment relationships, taking into account, inter alia, the principle of good faith.

Article 22, highlighting the issue of transparency in algorithmic decision-making, provides that, in order to understand, and potentially challenge (article 22 (para. 3)), the reasoning underpinning such decisions (see Recital 71), it is first necessary to discern the inferences upon which the decision was based. In other words, one must be informed of the criteria through which the so-called *algo-created data*, produced via *big data analytics* and *machine learning*, are generated; these data, when combined, enable correlations that give rise to

[169] M. PERUZZI, "*Il diritto antidiscriminatorio al test di intelligenza artificiale*", in LLI, 2021, vol. 7, n. 1, pp. 56-57.

subjective evaluations of the worker, which are not directly verifiable by the individual concerned.

For instance, to determine the productivity level of a given worker, and potentially award a promotion or, conversely, assign responsibility, it is necessary to understand the correlation between data relating to the speed of task completion, the hours during which the task was performed, and variables such as the worker's gender, family obligations, social life on platforms, and so forth.

Accordingly, it can be concluded that the more sophisticated the algorithmic management, the greater its capacity to generate "novel" data relating to the individual, derived from assessments of their personality and predictive analyses of their likely behaviour[170].

3.1. ***The function of the DPIA in safeguarding human oversight and ensuring transparency within semi-automated decision-making processes.***

In order to gain a more profound understanding of the aforementioned guarantees of human oversight and transparency, particularly in the context of algorithmic systems as envisaged under the *GDPR*, it is pertinent to consider the scenario of a decision-making process that is not fully automated, yet capable of producing certain legal effects or similarly impacting the data subjects.

Evidently, in order to ensure that the system is not confined solely to the scope of article 22, the involvement of the human operator must attain a threshold of "*significance*".

In this regard, the article 29 *Working Party* has stipulated that "*for human involvement to be present, the controller must ensure that any review of the decision is meaningful and not merely a symbolic gesture. The review should be conducted by a person with the authority and competence to modify the decision. In the context of the assessment, that person should take into account all relevant data*"[171][172].

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[170] R. MESSINETTI, "*La Privacy e il controllo dell'identità algoritmica*", in Contratto e impresa Europa, 2021, n. 1, pp. 141 ss.

[171] Article 29 Working Party, *"Guidelines on Automated Decision-Making and Profiling"*, WP 251, 3 October 2017, amended and adopted 6 February 2018, para. IV, sect. A.

[172]Moreover, although a comprehensive definition of the degree of "*significance*" of human involvement is lacking, doctrinal commentary maintains that the relevant documents delineate three fundamental characteristics. Firstly, the human operator required to make a given decision must possess the capacity, while being duly equipped with the necessary expertise and authority, to deviate from the recommendations provided by the algorithm (A. TODOLI' – SIGNES, "*Algoritms, artificial intelligence and automated decisions concerning workers and the risks of discrimination: the necessary collective governance of data protection*", in ETUI, 2019, pp. 471-472). Secondly, this presupposes, on the one hand, the human reviewer's capacity to fully comprehend the operational mechanisms of the algorithmic system and, on the other hand, the fact that they possess and duly

Accordingly, the Data Protection Impact Assessment (hereinafter, DPIA), pursuant to the aforementioned article 35, assumes particular importance, as it serves to identify and record the extent of the controller's involvement within the scope and specific phase of the decision-making process, thereby assessing the practical applicability of the prohibition set forth in article 22[173].

The distinctiveness of the *DPIA* lies, in certain respects, in its role as the focal point of the risk-based model delineated by the *GDPR*.

Primarily, it constitutes the "lifeblood" of the principles of human oversight and transparency, insofar as article 35 imposes, on the one hand, an obligation to provide appropriate safeguards to mitigate risks to the rights and freedoms of data subjects (which, in the case of algorithmic decision-making processes, materialises in the guarantee of human oversight), and, on the other hand, mechanisms designed to reinforce full compliance of the data processing with the principles of the Regulation, including, inter alia, those of transparency, fairness, and good faith.

Specifically, when the issue is examined from a regulatory perspective of the aforementioned model, and, consequently, at the culmination of a risk classification process, the safeguards concerning human control and transparency become the subject of specific protocols, which are regularly updated and tailored by the employer, taking due account of the peculiarities of the algorithms, as well as the complexity, autonomy, and data dependency inherent to their operation.

Indeed, although the guarantee relating to the ability to challenge an automated decision is explicitly confined to the scenarios envisaged under Article 22, it should be emphasised that the guidelines of the Article 29 Working Party suggest a form of extension of these measures

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consider all information pertinent to the adoption of a particular decision, including data provided by the data subject, namely the platform worker (B. GREEN, "*The Flaws of Policies Requiring Human Oversight of Government Algorithms*", in CLSR, vol. 45, 2022).

[173] Article 29 Working Party, *"Guidelines on Automated Decision-Making and Profiling"*, *cit*., para. IV, sect. A. In particular, specific significance is to be attributed, as in the context of work organisation, to paragraph 3 of article 35, pursuant to which a Data Protection Impact Assessment (DPIA) is mandated whenever the decision-making process entails a comprehensive evaluation of personal aspects concerning natural persons, with a concurrent obligation on the employer to carry it out whenever an automated decision-making process is employed. On the basis of the guidelines issued by the *Article 29 Working Party*, it is necessary, for such an obligation to be operational, that at least one of the following conditions be met: systematic monitoring, the use of data concerning interests deemed vulnerable (such as those of employees), or the application of technological and organisational solutions characterised by a certain degree of innovativeness. In other words, it suffices that a decision-making process, even if semi-automated, utilising personal data of platform workers, is initiated, for the aforementioned obligation to become effectively operational.

to the generality of automated decision-making processes, particularly in the context of profiling and, consequently, work organisation[174].

Moreover, the significance of the DPIA can also be discerned in the context of consultation with workers and their representatives, whereby the aforementioned *Working Party* has interpreted paragraph 9 of Article 35 as requiring the controller, where possible, to seek the views of the data subjects or their representatives, and to justify any refusal or deviation from the opinion provided.

Ultimately, it is a matter of debate whether the adequacy of the measures implemented may be assessed in the light of a code of conduct under article 40 GDPR, or a collective agreement pursuant to article 88, the objective of which is to establish more stringent rules in order to more effectively protect platform workers, including in the exercise of their rights and entitlements within the employment relationship.

This latter solution, moreover, appears to have been endorsed by the European social partners in the context of the 2020 framework agreement on digitalisation, where particular emphasis was placed on the role of the collective agreement (which, unlike codes of conduct, is not subject to any ex ante compliance review by the supervisory authority), as a tool to regulate protections, thereby enabling workers' representatives to engage in discussions on issues relating to data, consent, privacy, and oversight[175].

It is further noteworthy, to complete this analysis, that the aspects under consideration find explicit articulation in article 12, which provides, in general terms, that all information and communication relating to data processing must be provided "*in a concise, transparent, intelligible and easily accessible form, using clear and plain language*".

From this premise, it becomes abundantly clear that, within the *GDPR* framework, the protective measures linked to transparency serve to strengthen the subjective position of the worker, emphasising their role in the direct safeguarding of personal dignity[176].

Indeed, in a system such as a digitalised one, whose function is to execute organisational and managerial tasks delegated by the employer, thereby creating a sort of "structure" in which the prerogatives of the employer become less overt[177], and in which the risk of opacity in data

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[174] Article 29 Working Party, *"Guidelines on Automated Decision-Making and Profiling"*, *cit*., par. VI.

[175] A. TOPO, D. TARDIVO, "*Hard law e soft law nel diritto dell'Unione europea in materia di trattamento dei dati personali e di tutela della riservatezza del lavoratore*", in C. PISANI, G. PROIA, A. TOPO (a cura di), Privacy e lavoro. La circolazione dei dati personali e i controlli nel rapporto di lavoro, Giuffrè, Milano, 2022, p. 75 e 92.

[176] Moreover, article 115 of Legislative Decree No. 196/2003, within the context of agile work, stipulates that the employer must ensure respect for the worker's personality and moral freedom.

[177] P. TULLINI, "*La questione del potere nell'impresa. Una retrospettiva lunga mezzo secolo*", in LD, 2021, p. 442.

collection, processing, and the logic governing their use within automated processes is ever-increasing, such opacity may, moreover, significantly affect the position and identity of the platform worker.

In this context, the doctrinal interpretation of the 1990s remains highly pertinent, according to which it would be reductive to ascribe to subjective positions concerning knowledge and information a merely instrumental or preparatory role in achieving further objectives, should one limit oneself to highlighting the relationship between such protection and other interests, or reduce it to a mere intermediate step necessary for the fulfilment of different needs[178].

Indeed, such subjective positions ought to be initially valorised in their primary function of safeguarding the dignity of the worker, thereby allowing a mitigation of the economic primacy enjoyed by the employer, while simultaneously preventing the worker from being regarded merely as the recipient of opaque decisions, in relation to which they are unable fully to comprehend the underlying purposes[179].

Moreover, it should be acknowledged that transparency protection techniques are capable of providing instruments which, on the one hand, enable the worker to perform their duties accurately, while, on the other, confer upon them the right to demand the precise fulfilment of others' obligations[180], thereby enabling the operationalisation of employer power controls.

These are focused on the external limits established by specific or general labour law sources, including prohibitions of discrimination and obligations concerning health and safety, as well as derived from adherence to the general principles of fairness and good faith in the execution of contractual duties.

4. In-depth analysis of the Artificial Intelligence Regulation and its interaction with the GDPR: new safeguards for workers' rights.

The legal framework proposed by the EU necessitates an examination of whether the regulatory regime established by the GDPR, particularly regarding the safeguards afforded to platform workers in the context of algorithmic systems, can be complemented by the *Artificial Intelligence Regulation*, which constitutes the epicentre of the *risk-based* approach. From a general overview of this Regulation, it is evident that, on the one hand, technological tools are capable of delivering substantial benefits and significant opportunities; on the other hand,

[178] E. GRAGNOLI, "*L'informazione nel rapporto di lavoro*", Torino, Giappichelli, 1996, p. 213.
[179] E. GRAGNOLI, "*L'informazione nel rapporto di lavoro*", *cit*., p. 212.
[180] G.G. BALANDI, "*L'informazione nei rapporti di lavoro e sindacali*", in RTDPC, 1993, p. 748; C. FALERI, "*Asimmetrie informative e tutela del prestatore di lavoro*", Milano, 2007.

they undeniably carry inherent risks due to, as previously noted, their opacity, the absence of human oversight in algorithmic decision-making processes, and the potential for such processes to produce errors or discriminatory outcomes, thereby posing clear threats to the fundamental rights of workers.

It is precisely in response to these risks that the European Commission published, on 21 April 2021, the draft Regulation, commonly referred to as the *Artificial Intelligence Act*, which was subsequently approved in April 2024 and entered into force on 1 August 2024 (hereinafter referred to as Regulation 2024/1689).

This represents an initial attempt to regulate AI comprehensively and is the culmination of a process marked by several preparatory acts and soft law initiatives in the field of artificial intelligence[181]. Moreover, it should be noted that the aforementioned Regulation, which aims to establish a harmonised legal framework for AI, drew inspiration from the work undertaken by the *High-Level Expert Group on AI* and the guidelines issued by that Group in April 2019 concerning *Trustworthy AI*.

Prior to its formal adoption, the proposal was subjected to an impact assessment by the European Commission's *Regulatory Scrutiny Board* (see p. 3.3 of the *explanatory memorandum*).

With regard to the nature of the instrument chosen, the EU opted for a Regulation rather than a Directive, mirroring the approach adopted for the *GDPR* in the field of data protection. This choice is grounded in the legal basis provided by article 114 TFEU, which empowers the Union to adopt measures necessary to ensure the establishment and functioning of the internal market. Such a basis is suitable for establishing uniform (and thus harmonised) rules that are directly applicable throughout the Union, whilst allowing Member States a degree of discretion in relation to the regulation of so-called *sandboxes and codes of conduct*, particularly as regards enforcement and sanctioning mechanisms.

In this context, the need of undertaking certain updates to the regulatory regime should not be overlooked, given that a sector such as artificial intelligence, inherently challenging to regulate due to its constant developments, requires the European legislator to "keep pace" at the normative level, while also recognising that the most advanced AI systems (such as, by way of example, machine learning, deep learning, and neural networks) possess a high degree of autonomy and unpredictability regarding their operational mechanisms, further compounded, in many cases, by the limited intelligibility of their internal processes (as

[181] F. RODI, "*Gli interventi dell'Unione europea in materia di intelligenza artificiale e robotica: problemi e prospettive*", in G. ALPA (a cura di), Diritto e intelligenza artificiale, 2020, pp. 187-210.

exemplified by the so-called "*black box*" phenomenon), which may give rise to potential risks that cannot be anticipated *ex ante*[182].

It is nonetheless important to highlight that, in its attempt to address the challenges inherent in AI regulation, the Commission has not neglected, in its draft Regulation, the dynamic nature of potential AI applications and the associated risks, which, as noted above, are not always foreseeable in advance.

In light of this, two mechanisms have been devised to introduce flexibility into the regulatory regime, thereby enabling its timely update, with the ultimate aim of ensuring a so-called "*future-proof*" framework.

The first of these mechanisms concerns the annexes to the draft Regulation (whose amendments may be adopted by the Commission in accordance with Article 290 TFEU, through delegated acts and with the support of the *Comitology Committees* pursuant to article 74), which are fundamental for the recognition of AI systems deemed to be *high-risk*, and which require the execution of a specific compliance verification procedure.

This mechanism allows the legislation to be adapted to emerging challenges in its application, thereby obviating the need to resort to the ordinary legislative procedure for the revision of the Regulation. Moreover, the dynamic[183] and flexible nature of the regulatory regime is further ensured through the provision, within the draft Regulation, for a general five-year review[184], a practice which is, moreover, frequent in other jurisdictions addressing technology-driven innovation[185], such as the Directive on *Automated Decision-Making* in Canada, which is subject to a five-year revision cycle.

To concretely strengthen the above review mechanism, the draft Regulation appears to introduce, in Title V, the use of regulatory sandboxes, which constitute controlled environments established by Member States, within which, for a limited period, innovative AI systems may be developed, tested, and validated under the supervision of competent authorities; the purpose of such sandboxes is to evaluate the results, benefits, and, above all,

[182] M.U. SCHERER, "*Regulating artificial intelligence systems: risks, challenges, competencies and strategies*", in JOLT, 29, 2016, p. 365.
[183] R. POUND, "*Law must be stable, and yet it cannot stand still*", Interpretations of Legal History, Cambridge, 1923, I.
[184] See point 5.1. of *Explanatory Memorandum* and point 2.1 of *Mangement Measures* del *Legislative Financial Statement*.
[185] C. CASONATO, "*21st Century BioLaw: a proposal*", in BioLaw Journal, 2017, 1, pp. 81-95.

the risks posed by these systems, as well as their compliance with the regulatory regime, allowing amendments to be made where necessary[186].

Finally, the draft Regulation takes full account of the extreme variety and complexity of AI techniques and applications[187].

In this regard, although they fall under a unified definition of *software*, which, in relation to a series of human-defined objectives, is capable of generating *outputs* that affect the surrounding environment (art. 3), the techniques employed and their respective degrees of autonomy, unpredictability, and transparency vary considerably[188].

By way of illustration, expert systems, which operate according to a rigid if–then logic, differ markedly from neural networks, particularly in terms of autonomy and explainability, just as the degree of human oversight over AI systems is also variable, given that certain systems operate entirely autonomously (*Human out of the loop*), while others are fully governed by human operators (*Human in command*), without overlooking those systems that exhibit intermediate characteristics (*Human in the loop*, *Human on the loop*, etc.)[189].

It is therefore evident that a comprehensive understanding of the specific complexities of various AI systems has, to some extent, informed the definition of a proportionate risk-based approach in the proposal; the systems are, indeed, classified according to risk categories, which may be deemed unacceptable, subject to prohibition save for certain exceptions, high, encompassing the majority of the provisions of the Regulation, and low or minimal, not subject to particular restrictions but only to information obligations.

4.1. ***Regulatory scope and sphere of application.***

Building upon the foregoing premises, it is pertinent, in considering the scope of application of the Regulation, to note that, in light of the objective to provide protection that is as extensive, effective, and non-discriminatory as possible across the territory of the Union, article 2 is not confined to programmers, designers, producers, or suppliers domiciled within European States. Rather, it emphasises the location of the product and the utilisation of its outputs within the European market, thereby enabling the Regulation to bind any producer or

[186] See Recital 72, which, in order to ensure the uniform implementation of such testing environments, emphasises the necessity for common rules and close cooperation among the national authorities tasked with overseeing the *sandboxes*.

[187] L. D'AVACK, "*La rivoluzione tecnologica e la nuova era digitale: problemi etici*", in U. Ruffolo (a cura di), Intelligenza artificiale. Il diritto, i diritti, l'etica, Giuffrè, 2020, pp. 3-27.

[188] S. RUSSELL, P. NORVIG, "*Artificial Intelligence: A Modern Approach*", Prentice Hall, 2020, p. 17.

[189] S. AMATO, "*Biodiritto 4.0. Intelligenza artificiale e nuove tecnologie*", Torino, Giappichelli, 2020, p. 88.

user of such systems where activities such as commercialisation or deployment take place within the Single Market[190].

It is further notable that, with the exception of systems intended for military purposes[191], public authorities are explicitly included among the Regulation's addressees, whether acting as providers of such systems themselves or procuring them externally for the performance of official functions (so-called *contracting out*).

In this respect, the Regulation seeks to place public and private actors on an equal footing, harmonising the protective guarantees afforded to both, regardless of the differing legal regimes that typically govern the actions of public authorities and private entities.

It should be underscored that rudimentary software falls outside the scope of the Regulation, insofar as its design merely produces a single, discrete output from a given input. Consequently, the Regulation applies to automated management systems deployed by digital labour platforms[192].

Turning to the definition of artificial intelligence under article 3(1), this is articulated in two distinct elements. The first, of a functional character, is deliberately broad, encompassing software which, "*for a given set of human-defined objectives, may generate outputs such as content, predictions, recommendations, or decisions that influence the environments with which they interact*."

The second element identifies a series of techniques and approaches that serve to circumscribe the AI systems listed in Annex I**.**

In particular, three overarching categories are commonly recognised: *machine learning*, including supervised, unsupervised, and reinforcement learning; *logic-and knowledge-based* models, exemplified by expert systems; and statistical approaches, such as Bayesian inference[193].

It should be emphasised that the two components of the definition focus on distinct premises. While the general definition aligns more closely with the *risk-based* model adopted by the Regulation, thereby remaining technology-neutral and oriented towards the degree of influence a system may exert on the external environment, the list of techniques in Annex I,

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[190] A. BRADFORD, "*Brussells Effect. How the European Union rules the world*", in Oxford Academy, 2020.

[191] See Recital 12 and Article 2, third paragraph.

[192] P. DE PETRIS, "*Lavoro e piattaforme digitali. Qualificazione, poteri e tutele*", Giappichelli, Torino, 2025, p. 87.

[193] Specifically, Article 4 of the Regulation provides for the use of delegated acts to amend the list of techniques and approaches set out in Annex I, so as to ensure that the list remains up to date with future developments in the market and technology.

by contrast, delineates the application domain to more specific technological systems, reflecting the need to provide greater certainty to producers and users of AI systems. Against this backdrop, the Regulation establishes four distinct categories of AI systems, each subject to a corresponding regulatory regime. Priority is accorded to AI systems deemed to present an unacceptable level of risk: for some, a total prohibition applies, while for others, specific exceptions are permitted.

In particular, systems designed to manipulate human behaviour or actions through subliminal techniques or by exploiting vulnerabilities, such as age or disability (article 5(a) and (b)), are unequivocally prohibited where they are capable of causing physical or psychological harm to users or third parties.

Further, article 5(c) proscribes systems employed by public authorities to evaluate individuals' social reliability, for instance, through social scoring mechanisms, based on their actions or personal characteristics, where such evaluation results in disadvantageous treatment, especially where it occurs outside the context in which the data were collected, is unjustified, or is disproportionate relative to the social conduct in question. Moreover, article 5(d) prohibits the use of real-time biometric identification systems in public spaces for law enforcement purposes, save in specific instances, such as locating potential victims (e.g., missing children) to prevent imminent and serious threats to personal safety or terrorist attacks, or to identify or prosecute suspects of serious criminal offences, and to monitor drivers to prevent accidents due to fatigue.

Even in these cases, however, exceptions to the prohibition are subject to a risk-based assessment undertaken by the competent authority, supported by prior authorisation from an independent judicial or administrative authority, which evaluates both the severity and likelihood of harm arising from the failure to employ facial recognition systems and the attendant implications for the rights and freedoms of those affected.

Nonetheless, these provisions employ broad and indeterminate terminology, permitting divergent interpretations by national authorities, which may result in substantial disparities in the application of the rules across Member States and, consequently, an increased risk of legal disputes.

Title III of the Regulation, ultimately, focuses on high-risk AI systems, which constitute the central core of the legislative framework. In particular, as will be examined in further detail below, article 6 provides a classification of high-risk AI systems, supplemented by Annexes II and III, for which market placement is contingent upon compliance with the requirements set out in chapter II. These requirements necessitate a conformity assessment, conducted by the

provider itself, except in exceptional cases where the intervention of a third-party body is required, culminating in the issuance of a so-called declaration of conformity (article 47), which enables the system to obtain the European marking (article 48), thereby authorising its marketing within the European Union.

Furthermore, high-risk systems are recorded in a public database managed by the Commission (article 60), and, following their placement on the market, they are subject to post-market surveillance, intended to ensure the continuous fulfilment of requirements throughout the entire lifecycle of the system.

Beyond prohibited and high-risk systems, the Regulation also addresses low-or minimal-risk systems, governed by article 52, which constitute the majority of AI applications within the European common market and may circulate freely unless specific transparency obligations are imposed.

In particular, such obligations, for instance regarding the information provided to users about the use of AI systems, apply to systems that interact with humans (such as chatbots) and may conceal their artificial nature, or to systems that manipulate images**,** video, or audio (e.g., *deepfakes*), making people, objects, or locations appear authentic when they are not.

Limited exceptions to these transparency obligations are, however, envisaged, such as where a system is authorised by law for the purposes of crime prevention and prosecution, or to safeguard freedom of expression, artistic creation, or scientific research, as enshrined in the *European Union Charter of Fundamental Rights*[194].

4.2. ***High-risk systems under regulation 2024/1689: requirements, controls, and guarantees for the protection of fundamental rights.***

As previously noted, a substantial portion of the Regulation is dedicated to the governance of high-risk AI systems, commonly referred to as "*High-Risk AI Systems*", whose core principles are grounded both in ensuring compatibility and harmonisation with other European legislation, and in striking a balance between legal certainty and regulatory flexibility.

Firstly, it is noteworthy that the requirements enumerated in the Regulation are designed to align with principles already articulated in prior instruments, such as, for instance, the explanatory memorandum, which references the work undertaken by the *High-Level Expert*

[194] C. CASONATO, B. MARCHETTI, "*Prime osservazioni sulla proposta di regolamento dell'Unione europea in materia di intelligenza artificiale*", in BioLaw Journal, 2021, 3, pp. 7-9.

Group on AI, emphasising consistency with international recommendations and principles governing the EU's commercial partners.

Furthermore, Recital 12 underscores alignment with the European Union Charter of Fundamental Rights as well as other European legal instruments, including those encompassed within the *New Legislative Framework*[195].

The principle of flexibility is ensured, on the one hand, through the utilisation of annexes that can be readily updated[196], and, on the other, by allowing providers to select freely the means by which they comply with the requirements, thereby accommodating the latest scientific and technological innovations.

It is within this context that Title III of the Regulation, the most substantial, addresses high-risk AI systems, namely those capable of generating significant risks to the health, safety, and fundamental rights of natural persons.

In this regard, article 6 establishes that high-risk systems are defined not solely by their function, but also in light of their specific objectives and modes of use. Such systems may include both autonomous systems that impact fundamental rights and components of safety-critical products already subject to sector-specific conformity assessments[197].

The list of *high-risk* systems encompasses biometric technologies for personal identification, management systems for critical infrastructures, devices used in education and vocational training, employment, essential public services (such as healthcare), workforce management, and credit. For completeness, the category further includes systems employed by law enforcement, the judiciary, democratic processes, as well as those used for migration management and border control.

It is important to note that the Regulation applies not only to providers of AI systems intended for use within the European Union, but also to those situated in third countries, insofar as their systems are deployed within the EU territory.

With regard to preventive measures, article 9 stipulates that high-risk AI systems require particular attention and a heightened level of responsibility in their design, deployment, and societal use, given that such systems, far from being mere technological innovations, must ensure that they do not compromise the health, safety, or fundamental rights of individuals.

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[195] J. ANDRAŠKO, M. MESARČÍK, O. HAMUĽÁK, "*The regulatory intersections between artificial intelligence, data protection and cyber security: challenges and opportunities for the EU legal framework*", in AI and Society, 2021, 36, pp. 623-636.

[196] With specific reference to Annex III, see Article 7.

[197] Consider, for instance, "*AI systems intended to be used as safety component of products that are subject to third party ex-ante conformity assessment*" (see *Explanatory memorandum*, p. 24, in 000889482.pdf).

Accordingly, pursuant to paragraph 2 of article 9, a risk management system is mandated, constituting an iterative and continuous process that accompanies the AI system throughout its entire lifecycle, from initial design and development, through testing, to market placement and practical use.

This process unfolds through several fundamental stages, beginning with the necessary identification and analysis of foreseeable risks associated with the use of the AI system in accordance with its intended purpose (Art. 9(para. 2)(a)). Subsequently, an assessment of risks that may arise from reasonably foreseeable misuse is required (subparagraph (b)), which also encompasses the potential emergence of new risks following market placement, deriving from data collected during monitoring activities (subparagraph (c)). Finally, providers are obliged to implement targeted risk management and mitigation measures, thereby addressing the identified risks in a concrete and systematic manner (subparagraph (d)). It is noteworthy that such management measures, pursuant to Art. 9(para. 3), must pertain to risks that can reasonably be mitigated or eliminated through technical design or through clear instructions and information provided to users.

A central aspect, emphasised in art. 9(para. 5), is that residual risks, those that cannot be entirely eliminated, must be deemed acceptable.

This entails that, in determining the most effective risk management measures, the objective is to ensure the elimination or reduction of risks identified and assessed under paragraph 2. Such mitigation may be achieved technically through appropriate design and manufacturing of the high-risk AI system (subparagraph (a)).

Furthermore, there is scope to implement suitable measures for attenuation and control in addressing risks that cannot be eliminated entirely, alongside the provision of information required under art. 13 (to be discussed subsequently) and, where necessary, training and knowledge development for the deployers, which undeniably play a pivotal role (subparagraph (c)).

To ensure compliance, art. 9(para. 6) and (para. 7) require that *high-risk* AI systems undergo rigorous testing, which may include trials under real-world conditions. These tests are designed to ensure that the system operates as intended and conforms to legal requirements, based on pre-defined metrics and probabilistic thresholds (art. 9(para. 8)).

Particular attention is to be devoted to vulnerable groups, such as minors or other at-risk populations; in such cases, it is imperative to prevent any adverse effects arising from the use of the AI system (art. 9(para. 9)). Lastly, it is important to note that providers of high-risk AI

systems may integrate this risk management framework with other processes already established under European law concerning safety and compliance (art. 9(para. 10))[198].

Among the core measures are the use of high-quality datasets, the preparation of comprehensive technical documentation, human oversight, and the assurance of robustness, accuracy, and system security[199].

Ultimately, the Regulation, recognising the risks of errors or discrimination arising from the use of inaccurate data, establishes minimum requirements for the admission of high-risk AI systems into the European Single Market.

In this regard, the first requirement pertains specifically to data quality and governance, emphasising the necessity of employing data that are relevant, complete, and free from errors[200], whilst ensuring that they are representative of the specific contextual characteristics.

Furthermore, it mandates the maintenance of up-to-date technical documentation, which, pursuant to art. 11, allows for the assessment of impacts on fundamental rights[201], and, lastly, the Regulation also requires the automatic recording and traceability of logs (or operations), as stipulated in art. 12, in order to guarantee continuous oversight.

*4.3. **Addressing the "black box" of AI: transparency requirements under regulation 2024/1689 for high-risk systems.***

One of the foremost challenges attendant upon the deployment of advanced artificial intelligence systems pertains to the so-called *black box* phenomenon.

This term denotes the profound complexity inherent in devices utilising machine learning, deep learning, or neural network methodologies, whose internal operations are of such intricacy that it becomes practically infeasible to trace the entirety of the decision-making trajectory culminating in the final output.

Whilst the system's inputs and outputs may be readily observable, the internal mechanisms remain largely inscrutable, thereby rendering the comprehension of the decision-making

[198] See REGULATION (EU) 2024/1689 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 June 2024 laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 as well as Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act).

[199] See Article 9 and Recital 42 of Regulation (EU) 2024/1689**.**

[200] In particular, data management practices must encompass the critical decisions made during the system's design, the collection of data, preliminary operations such as annotation, labelling, cleaning, enrichment, and aggregation of data, as well as the derivation of insights from the data. This includes a prior assessment of the availability, volume, and suitability of the required data, an evaluation capable of detecting potential biases, and the identification of any existing gaps.

[201] With regard to the components of the documentation, reference should be made to Annex IV.

process, and any autonomous adaptations undertaken by the system to optimise performance[202], extraordinarily difficult.

Such opacity constitutes a matter of considerable concern, as it compromises the capacity to verify the coherence and justification of decisions rendered, thereby impeding the recognition of AI systems as reliable and trustworthy technologies, in accordance with the principles of *Trustworthy AI*[203].

In order to ameliorate this issue, drawing upon the precedent set by Canadian regulatory experience[204], the Regulation mandates that, from a preventative standpoint, all high-risk AI systems must be designed and developed so as to ensure an appropriate degree of transparency. Notwithstanding the inherent impossibility of attaining complete transparency, owing to the technological sophistication of these systems and the consequent opacity of their internal processes, the Regulation prescribes binding minimum standards under article 13.

These entail, inter alia, the provision of comprehensive user instructions for each high-risk system, comprising clear, accurate, and intelligible information.

Such documentation must include, at a minimum, the supplier's contact information, the objectives of the system, verified levels of accuracy, robustness, and cybersecurity, the characteristics of input datasets as well as those employed in training, validation, and testing, the anticipated operational lifespan of the system, and any other factors potentially impacting health, safety, or fundamental rights.

It is apparent that the imposition of a requisite standard of transparency for market access of high-risk systems represents a significant advancement. Scholarly discourse has long emphasised the imperative of addressing the *black box* challenge through proportionate measures, which, whilst refraining from imposing excessive obligations, ensure that users attain a substantive understanding of the logic underpinning the system.

In this regard, it is desirable to confer upon end-users, albeit in instances of partially automated decision-making, a right to be apprised of the fundamental reasoning underlying the AI-driven decision[205].

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[202] F. PASQUALE, "*The Black Box Society. The Secret Algorithms That Control Money and Information*", 2015.

[203] A. BIBAL et al., "*Legal requirements on explainability in machine learning*", in AI and Law, 2021, 29, pp. 149-169.

[204] The so-called *Directive on Automated Decision Making* (In force since April 2019, subject to review every six months, establishes "*a meaningful explanation to affected individuals of how and why the decision was made»: «In addition to any applicable legal requirement, [any Automated decision Making process must ensure] that a meaningful explanation is provided for common decision results*".

[205] A. SIMONCINI, "*L'algoritmo incostituzionale: intelligenza artificiale e il futuro delle libertà*", in BioLaw Journal, 2019, 1, p. 76.

Such a right facilitates meaningful oversight and the verification of the rationale underpinning the system-generated outputs, thereby permitting an assessment of the system's reliability.
Indeed, in highly sensitive domains, such as the administration of justice, a decision rendered by an AI system, if not accompanied by an adequate explication of its reasoning, could be deemed intrinsically illegitimate[206].

4.4. ***AI system autonomy and human oversight.***

With reference to the foregoing discussion regarding the degree of autonomy exercised by AI systems in the performance of their designated functions, it is essential to underscore that such autonomy assumes differing roles depending upon the context in which the system is deployed. While full autonomy may give rise to concerns, particularly where it pertains to operations of substantive professional significance or those affecting fundamental rights, there are circumstances in which it has been argued that autonomy should be circumscribed due to the inherent shortcomings of technological systems. Indeed, once the "black box" issue is addressed and the risks of error and bias are mitigated, it may be feasible to entrust machines, capable of rational and impartial operation, with tasks currently performed by fallible human agents.
Conversely, others maintain that certain sensitive functions, such as those within medical or judicial domains, must remain under human oversight owing to the inextricable element of responsibility, which cannot be delegated to machines[207].
Within this perspective, the *GDPR* has already, as previously discussed, enshrined in article 22 the individual's right not to be subject to decisions based solely on automated processing, including profiling, which produce legal effects or similarly significant impacts on the person, save for certain exceptions, such as decisions necessary for the performance of a contract or based upon the explicit consent of the individual. It should be noted, however, that the latter exception often risks undermining effective protection, particularly in digital contexts, where consent is frequently provided in an uninformed manner[208]. To address this, the Regulation extends this principle by establishing, in Article 14, that all high-risk AI systems must be designed to ensure effective human oversight aimed at preventing and mitigating potential

[206] C. CASONATO, "*Intelligenza artificiale e giustizia: potenzialità e rischi*", in DPCE online, 2020, 3, pp. 3369-3389.
[207] C. CASONATO, "*AI and Constitutionalism: The Challenges Ahead*", in B. BRAUNSCHWEIG, M. GHALLAB, (Eds.), Reflections on Artificial Intelligence for Humanity, Switzerland, Springer, 2021, pp. 138 ss.
[208] C. CASONATO, "*Costituzione e intelligenza artificiale: un'agenda per il prossimo futuro*", in BioLaw Journal, 2019, p. 719.

risks to health, safety, or fundamental rights, even when the system is used in compliance with requirements or in a predictable manner. It is evident that, in its effort to balance rigour with flexibility, the Regulation, having imposed on the employer (as the user of the AI system) the obligation of human supervision, specifies in article 14.4 that the human overseer must be capable of performing certain functions adequately[209].

These include fully understanding the capabilities and limitations of the system to monitor operations, promptly detect anomalies, and address unforeseen consequences (letter a), as well as demonstrating the capacity to correctly interpret the system's outputs (letter c).

A further point of particular significance is the recognition that human supervision must avoid blind reliance on AI, thereby preventing excessive trust in its outcomes (letter b)[210].

In this regard, the Regulation provides that the human overseer may not only disregard or even modify the results generated by the AI system (letter d), but also possesses the authority to halt its operation entirely (the so-called "*kill switch*", letter e).

Notably, in the context of systems employed for remote biometric identification, whether in real time or subsequently, it is stipulated that decisions must be validated by at least two supervisors (Article 14.5).

This segment of the Regulation, addressing excessive reliance on AI and the capacity to contravene its outputs, exemplifies a pragmatic approach, recognising that the right to human oversight risks ineffectiveness, as evidenced by article 22 of the GDPR, unless it is reinforced by concrete measures facilitating its implementation.

Even where such a right exists, questions arise as to which supervisor would assume responsibility for contesting a decision perceived as correct and impartial solely because it was generated by a machine[211].

In this context, the risk of a so-called "*herd effect*" has been identified, whereby a decision might be automatically accepted merely because it originates from AI, rendering human supervision a formalistic exercise devoid of substantive efficacy[212].

The Regulation's provisions, conversely, seek to actively mitigate this risk by providing tangible mechanisms to ensure genuine human control.

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[209] This follows the same logic as the aforementioned Canadian directive, wherein it is established that "*an Automated Decision System allows for human intervention, when appropriate*".

[210] S. RODOTÀ, "*Il diritto di avere diritti*", Roma-Bari, 2012, pp. 401 ss.

[211] T. ARAUJO et al., "*In AI we trust? Perceptions about automated decision-making by ar tificial intelligence*", in AI and Society, 2020, 35, pp. 611-623.

[212] A. GARAPON, J. LASSÈGUE, "*Justice digitale. Révolution graphique et rupture anthropologique*", in PUF, 2018, p. 239.

Moreover, an interpretation limiting the employer's responsibility to the obligation of human oversight alone may be overly narrow, particularly in relation to other duties incumbent upon the user, including the requirement to conduct a *Data Protection Impact Assessment* (*DPIA*) pursuant to the GDPR. Indeed, the coordination of these obligations, with regard to human involvement in system operation and management oversight, substantially broadens the scope of the guarantee of human supervision.

In this respect, article 26 (para. 9) is of particular significance, asserting that users of *high-risk* AI systems, including those deployed within the context of labour organization, must utilise the information and training received to fulfil the obligation to conduct a *DPIA*, in accordance with article 35 of the *GDPR*.

Furthermore, under article 27 of the Regulation, prior to the deployment of a *high-risk* AI system, as delineated in article 6(2) of the same Regulation, deployers, which, it should be emphasised, include both public law bodies or private entities delivering public services, as well as those employing high-risk AI systems listed in Annex III, point 5, letters b) and c), are obliged to undertake an assessment of the potential impact that such use may exert upon fundamental rights.

Indeed, such an assessment, comprising a comprehensive analysis of multiple elements, necessitates an initial description of the deployer's processes in which the system will be utilised, clarifying how such use aligns with its intended purpose.

Furthermore, it is essential to specify the temporal scope and frequency for which the system is designed to be deployed. A central aspect pertains to the identification of the categories of natural persons and groups potentially affected by the system's use within the specific context, coupled with an analysis of the risks of harm these individuals may incur, taking into account the information provided by the supplier pursuant to article 13. The assessment must also include a description of the mechanisms through which human oversight is ensured, in accordance with the instructions for the system's use. Finally, it is necessary to envisage all appropriate measures should the identified risks materialise; these encompass internal governance arrangements as well as accessible and adequate complaint mechanisms.

In this manner, the assessment does not merely identify potential risks, but also establishes a framework for prevention and management, thereby concretely safeguarding the rights of the individuals involved[213].

[213] See Regulation 2024/1689, Article 27.

Moreover, where such use entails the processing of personal data, the user, acting in this respect as the data controller under the *GDPR*, is obliged to assess and manage the risks that these systems may pose to the data subjects whose information is processed within the organisation.

For the purposes of the present analysis, it is particularly noteworthy that this coordination provision within the Regulation gains considerable significance given that the information available to the employer, as the system user, assumes a pivotal role in regulating, firstly, the measures safeguarding all rights and freedoms of employees (identified as data subjects) who may be potentially exposed to risks arising from the use of AI systems, and, secondly, the guarantees of transparency, fairness, and accuracy.

Furthermore, as the *DPIA* entails the involvement of employees, as data subjects, and their representatives (such as trade unions), unless the employer is in a position to justify a refusal, the acquisition of such opinion must be preceded by the provision of appropriate information to the parties concerned, which is to be extended, pursuant to Recital 47, to the instructions for use and any other relevant documentation supplied by the provider (for instance, the characteristics addressed in article 13, as analysed above).

Ultimately, from a risk-reduction perspective, particularly where the individuals concerned are considered vulnerable, such as employees, the *European Social Partners' Framework Agreement on Digitalisation*, concluded in June 2020, is especially pertinent. This Agreement exemplifies a process whereby the safeguards afforded to workers are negotiated between social partners and operationalised through co-regulatory mechanisms, collaborative approaches, and joint monitoring[214].

In this regard, article 88 of the GDPR assumes particular significance, as it permits the implementation of detailed measures aimed at safeguarding workers, either through collective bargaining agreements or national legislation. Indeed, such legislation may serve to reinforce the protections enshrined in collective agreements, thereby standardising and strengthening both substantive and procedural safeguards that are essential for the practical realisation of protections associated with the *DPIA*[215].

Complementing the foregoing, as previously noted, the market entry of high-risk AI systems is contingent upon compliance with the specific requirements set out in chapter II of the Regulation. In this context, the model adopted by the European Commission to ensure such

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[214] A. ALOISI, "*Regulating Algorithmic Management at Work in the European Union: Data Protection, Non-discrimination and Collective Rights*", in IJCCLIR, 2024, 1, pp. 1 ss.

[215] M. PERUZZI, "*Intelligenza artificiale e lavoro. Uno studio su poteri datoriali e tecniche di tutela*", *cit*., pp. 70-73.

compliance closely mirrors the CE marking certification procedure, long employed to regulate numerous products within the European market, as exemplified by Directive 2009/48 on the safety of toys and Directive 2001/95 on general product safety[216].

The CE mark allows a product to be marketed within the European Union (and the wider *European Economic Area*, encompassing non-EU countries such as Norway, Iceland, and Liechtenstein) once it has successfully undergone a conformity assessment against Union standards. This process may be conducted either by the manufacturer itself or by a third-party certification body; unlike the regulatory framework for medicinal products or genetically modified organisms, which necessitates formal public authorisation, high-risk AI systems do not require such authorisation at the national or European level; compliance is assured through self-assessment by the producer.

The advantages of this approach are manifest: whereas public authorisation, albeit providing heightened safety guarantees, entails significant costs and may prove less efficient, the CE marking procedure, by shifting the onus of compliance onto the producer, facilitates market entry and allocates responsibility for adherence to safety requirements directly to the economic operators.

Nonetheless, this procedure is not without its limitations.

For certain AI systems, such as biometric technologies enumerated in Annex III, a conformity assessment conducted by a third-party body is deemed necessary, as stipulated in article 43(para.1) of the Regulation[217]; moreover, any amendments to the Regulation affecting conformity assessment procedures would be reflected in the updating of Annexes VI and VII[218].

It is also important to note that initial conformity assessment is not the sole form of oversight; the Regulation additionally mandates a post-market monitoring system to ensure that AI systems continue to meet the requisite standards throughout their entire lifecycle (article 61).

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[216] D. HANSON, "*CE Marking, Product Standards and World Trade*", Edward Elgar, 2005.

[217] Furthermore, article 43 provides that, even in the case of biometric systems, where the provider applies the harmonised standards referred to in article 40 of the Regulation or, where applicable, the common specifications under Article 41, in order to demonstrate the conformity of the high-risk system with the requirements set out in Chapter II, they may choose between the internal conformity assessment procedure or one conducted by a third-party body.

[218] Article 43, paragraph 5, provides that "*The Commission is empowered to adopt delegated acts in accordance with article 73 for the purpose of updating Annexes VI and VII in order to introduce elements of the conformity assessment procedures that become necessary in the light of technical progress*". As further confirmation, paragraph 6 establishes that "*The Commission is empowered to adopt delegated acts to amend paragraphs 1 and 2 in order to subject high-risk AI systems referred to in points 2 to 8 of Annex III to the conformity assessment procedure referred to in Annex VII or parts thereof*".

From the perspective of labour rights, the *European Trade Union Confederation* (ETUC), in its position of 28 May 2021, highlighted the importance of third-party conformity assessment, particularly for AI systems impacting the workplace, while advocating for coordination between *ex-ante compliance checks* and *ex-post enforcement measures*[219].

Each Member State is therefore required to designate an authority responsible for monitoring, with specific obligations imposed on both the system provider and the user: the provider must maintain records of system operations, implement corrective measures where necessary, and report any breaches to the competent authorities (articles 20–23).

The provisions governing conformity assessment bodies and the requirements imposed upon them mirror those already established under the CE marking framework. Consequently, each Member State is obliged to designate a notifying authority responsible for managing the assessment and notification procedures of certification bodies (article 30). Such an authority must operate in a manner that precludes any conflicts of interest with the certification bodies themselves.

Furthermore, article 33(para. 4) specifies the requirements that certification bodies must fulfil, including adequate organisational and financial resources, as well as independence from the providers of the systems under assessment.

The national notifying authority is required to communicate the list of certification bodies to the Commission and other Member States via an electronic tool. In instances where doubts arise regarding the compliance of a certification body, the Commission may, pursuant to article 37, conduct investigations and adopt corrective measures, including, if necessary, the withdrawal of the notification.

Certification bodies are obliged to cooperate with the notifying authority throughout the entirety of their operations, providing documentation necessary for verification purposes and adhering to substantial reporting obligations vis-à-vis both the notifying authority and other certification bodies.

Pursuant to article 45, Member States must ensure that any party with a legitimate interest may submit an appeal for the review of decisions issued by certification bodies. Such a review, far from being a mere procedural check of legality, may lead to a substantive reassessment of the decision, including the involvement of an administrative division of the notifying authority.

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[219] M. PERUZZI, "*Intelligenza artificiale e lavoro. Uno studio su poteri datoriali e tecniche di tutela*", *cit.*, p. 69.

5. The European Union Directive on Work via Digital Platforms.

The principles delineated in the legislation hitherto examined have also found a point of culmination within the framework of the proposed Directive on work via digital platforms, put forward by the European Commission on 9 December 2021.

This initiative was subsequently followed by a first provisional agreement in December 2023, which was not endorsed by the Coreper, and a second provisional agreement reached on 8 February 2024, later confirmed by the EU Ministers for Employment and Social Affairs on 11 March 2024. Ultimately, the Directive was approved by the European Parliament plenary on 24 April 2024 and received its definitive adoption by both the European Parliament and the Council on 23 October 2024, subsequently published in the Official Journal of the European Union on 11 November 2024, entering into force on 1 December 2024, with a transposition deadline set for 2 December 2026.

This type of work is characterised by an organisational structure profoundly influenced by incessant technological innovation, wherein the pervasive control exerted by digital platforms over the execution of tasks carried out through their systems renders increasingly salient the risks impinging upon the health, safety, and intrinsic dignity of workers[220].

It is also noteworthy that, within this form of employment, psychosocial risks coexist with so-called "*conventional*" hazards, such as pathologies related to work-related stress or occupational accidents inherent to the specific contexts in which, for instance, riders perform their duties. These tasks, although regulated through algorithmic systems, fundamentally rely upon physical exertion and the capacity to navigate, often solely with the aid of a bicycle, through urban traffic[221].

Primarily, the Directive seeks to promote the enhancement of working conditions, alongside the protection of personal data, within platform-mediated work, ensuring that these novel forms of labour organisation do not inevitably compromise the rights of the workers involved. To achieve this objective concretely, the Directive pursues multiple avenues, including measures designed to facilitate the determination of workers' employment status, while simultaneously fostering transparency, fairness, human oversight, safety, and accountability in the "*algorithmic management*" of work.

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[220] A. ROTA, "*Tutela della salute e sicurezza dei lavoratori digitali. Persona e pervasività delle tecnologie*", in P. Tullini (a cura di), Web e Lavoro. Profili evolutivi e di tutela, Torino, 2017, pp. 165 ss.

[221] P. PASCUCCI, "*Dignità del lavoratore e sicurezza sul lavoro nella civiltà digitale*", 2023, pp. 3-4, in Dignità del lavoratore e sicurezza sul lavoro nella civiltà digitale.

Moreover, it aims to reinforce transparency in such forms of employment even where platforms operate across national borders. These objectives are underpinned by two distinct legal bases: on the one hand, the competence of the Union under Article 153(1)(b) TFEU, insofar as it pertains to the improvement of working conditions; and, on the other, the Union's competence regarding the protection of natural persons with respect to the processing of personal data, pursuant to article 16(2) TFEU.

Specifically, while, under the first competence, the Directive seeks to establish minimum rights for workers engaged via digital platforms within the European Union (article 1(para. 2), first subparagraph), without prejudice to the discretion afforded to Member States under article 26 to apply more favourable provisions for such workers, the second competence encompasses normative measures aimed at enhancing the protection of natural persons with regard to the processing of personal data. This includes the identification of measures designed to ensure the effective and proper algorithmic management of tasks performed by platform workers (article 1(para. 2), second subparagraph).

Finally, prior to a detailed examination of the provisions of the Directive, it should be emphasised that its scope does not extend to digital platforms in general, but is confined to "*digital labour platforms*." These are defined as any natural or legal person capable of offering a service that fulfils certain essential criteria, namely that the service must be provided, at least in part, remotely through electronic means, whether via a website or a mobile application, upon request from a service recipient, necessitating an organised labour effort performed by natural persons for remuneration, regardless of the location in which such activity is carried out, and ultimately involving the utilisation of automated decision-making or monitoring systems (article 2(para. 1))[222].

5.1. ***Health, safety, and accountability in the management of automated systems in the original proposal text.***

Drawing upon the original formulation of the European Commission's draft Directive, it is noteworthy that a central concern, as emphasised in Recital 38, pertains to the sometimes detrimental effects that automated decision-making and monitoring systems may exert upon the physical and mental health of workers engaged via digital platforms.

[222] M. SIX SILBERMAN, "*The definition of "digital labour platform"in the Proposed Platform Work Directive*", in verfassungsblog, 18 luglio 2023.

In this regard, articles 6 and 7 of the Directive seek to address this issue by imposing a series of obligations upon both digital platforms and the Member States, particularly with respect to the prevention of occupational health and safety risks.

Specifically, paragraph 2 of article 7 reinforces the pre-existing duties of prevention enshrined in occupational health and safety legislation.

Accordingly, digital platforms are required to assess the risks that may arise from automated decision-making and monitoring systems, including potential workplace accidents, psychosocial hazards, and ergonomic risks.

Platforms must also evaluate the adequacy of the safeguards provided by such systems in relation to the specific risks inherent to the working environment, implementing all necessary preventive measures.

Clearly, platforms are prohibited from deploying such systems to the extent that they subject workers to undue pressure or compromise their psycho-physical well-being[223], thereby underscoring the intrinsic link between worker dignity and safety, a principle that must serve as the foundational consideration when deciding to implement automated systems. Consequently, the proposal highlights the need to establish a robust institutional framework for prevention, whereby Member States are tasked with enacting rules accompanied by an effective supervisory apparatus to ensure that platforms engage in continuous monitoring and periodic assessment of the impact of automated decisions on working conditions.

To this end, platforms must maintain adequate human resources, endowed with the requisite expertise, training, and authority, ensuring that workers, as previously emphasised, do not suffer adverse consequences as a result of disregarded automated recommendations or system-generated decisions[224].

In this context, a core principle of occupational safety, supervision, resurfaces.

By placing the human operator at the centre of control, and thus above the machine, supervision must be guaranteed both by public authorities and within the organisations themselves, through the establishment of a proper system for human monitoring of automated processes[225].

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[223] Art. 7, paragraph 2, (second sentence).

[224] Art. 7, paragraph 3.

[225] P. PASCUCCI, L. ANGELINI, C. LAZZARI, "*I "sistemi" di vigilanza e di controllo nel diritto della salute e sicurezza sul lavoro*", in LD, 2015, pp. 622 ss.

Furthermore, Member States must oblige platforms to inform workers about the use of automated decision-making systems, particularly where such systems have a significant impact on their working conditions, including aspects relating to health and safety[226].

In this regard, while it is commendable, on the one hand, to emphasise the correlation between worker dignity and safety, highlighted by the obligation to assess even the more concealed risks associated with automated systems, on the other hand, Article 10 of the draft Directive raises considerable concerns.

Although it extends certain protections to individuals working via digital platforms without an employment contract, such as genuinely self-employed persons, it nonetheless excludes these categories from the obligations to assess risks, implement preventive measures, and prohibit undue pressures arising from automated systems[227].

*5.2. **Expanding health and safety guarantees for platform workers in light of the European Parliament's amendments to the directive proposal.***

The matter of occupational health and safety within digital platforms, initially addressed in the Commission's original draft Directive, assumes even greater prominence in the amendments incorporated into the European Parliament's Legislative Resolution of 21 December 2022[228], notwithstanding the persisting, and arguably contentious, limitation that the application of health and safety measures is confined exclusively to workers employed under a formal contract[229].

In this regard, it is, on the one hand, emphasised that the process of digitalization, particularly through the deployment of automated decision-making and monitoring systems, engenders profound risks to workers' physical and mental well-being[230]; on the other hand, it is equally acknowledged that such workers are entitled to fundamental protections, including safeguards against these very risks within the frameworks governed by algorithmic management systems[231].

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[226] Art. 8, paragrafo 1.

[227] A. ALAIMO, "*Il pacchetto di misure sul lavoro nelle piattaforme: dalla proposta di Direttiva al progetto di Risoluzione del Parlamento europeo. Verso un incremento delle tutele?*", in LLI, 2022, p. 18.

[228] This analysis refers to the Draft Legislative Resolution of the European Parliament concerning the proposal for a Directive of the European Parliament and of the Council on improving working conditions in platform work (COM(2021)0762 – C9-0454/2021 – 2021/0414(COD)).

[229] Amendment 55 to Recital 40 of the proposed Directive.

[230] Amendment 5 to Recital 4 of the proposed Directive.

[231] Amendment 16 to Recital 13 of the proposed Directive.

Furthermore, as noted at the outset, phenomena such as limited on-the-job learning, reliance on opaque algorithms, intensification of labour, and employment insecurity, cumulatively, are capable of exacerbating stress and anxiety among workers, with deleterious consequences for their welfare, health, and human dignity[232].

Of particular significance is the principle that decisions bearing upon health and safety must be made by human actors rather than by automated systems[233]; in this context, digital platforms are required to ensure effective human oversight, complemented by the involvement of workers' representatives, to evaluate the implications of such decisions for working conditions and the fundamental rights of employees, including their dignity and well-being[234]. In this respect, the draft Directive articulates that decisions impacting health and safety, far from being the sole prerogative of automated systems, must be consistent with applicable national legislation and collective agreements[235].

Moreover, it provides that individuals charged with reviewing such decisions must be actively engaged in scrutinising the recommendations generated by automated systems, exercising genuine authority to amend or reject such recommendations as necessary[236].

A particularly noteworthy aspect of the Resolution is Amendment 50, which revises Recital 38 (as well as point (a) of paragraph 2 of article 7[237]), extending the focus beyond merely identifying risks to physical and mental health to encompass the broader domain of workers' safety. Under this amendment, and in accordance with the principle of primary prevention enshrined in Directive 89/391/EEC, digital platforms are mandated to both analyse and preclude such risks, and, where avoidance proves unfeasible, to address them at source through the implementation of appropriate preventive and remedial measures.

This rationale is further reflected in point (a) of paragraph 2 of article 7, which, while originally requiring platforms to assess the risks posed by automated decision-making and monitoring systems to the health and safety of platform workers (particularly regarding potential occupational injuries and psychosocial or ergonomic hazards), now explicitly stipulates, in accordance with the Parliamentary amendment, that platforms must, as a matter of priority, "avoid" such risks, or, where avoidance is unattainable, to evaluate and mitigate them effectively[238].

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[232] Amendment 40, introducing new Recital 30a into the proposed Directive.
[233] Amendment 43, introducing new Recital 32a into the proposed Directive.
[234] Amendment 47 to Recital 35 of the proposed Directive.
[235] Amendment 122, introducing new paragraph 2a into Article 6 of the proposed Directive.
[236] Amendment 48, introducing new Recital 36a into the proposed Directive.
[237] Amendment 140 to article 7 (para. 2), first subparagraph, point (a), of the proposed Directive.
[238] Amendment 140 to article 7 (para. 2), first subparagraph, point (a), of the proposed Directive.

Moreover, the European Parliament, in the context of Amendment 50 to Recital 38, and with due regard to the fundamental principles enshrined in article 6 (para. 3) of Framework Directive 89/391/EEC[239], underscores the paramount importance of consulting workers and their representatives on all matters pertaining to occupational health and safety. It is emphasised that the planning and deployment of new technologies must be subject to consultation to enable a thorough assessment of their impact on working conditions and workplace safety. Another pivotal aspect of the amendment stipulates that digital platforms are obliged to conduct an annual evaluation of the impact of automated decision-making systems on working conditions, health and safety, and fundamental rights. Such evaluations imply that where risks to health, including mental health, cannot be effectively mitigated, the continued use of such systems is prohibited[240]. In this regard, Member States are tasked with ensuring that these evaluations are conducted regularly, with the active participation of workers' representatives[241].

Ultimately, the European Parliament stresses that automated decision-making and monitoring systems must not exert undue pressure on workers, for instance, through extraordinary incentives or punitive measures, such as performance evaluations affecting working hours and the allocation of tasks, or compromise their health[242], and must strictly prohibit discriminatory or penalising practices based on algorithmic assessments[243]. Consequently, should impact assessments reveal irresolvable risks, platforms are required to suspend the use of automated systems[244].

In the event of non-compliance, a further amendment to article 7 provides that national occupational health and safety authorities must adopt appropriate measures to ensure adherence to the relevant regulatory framework[245].

Finally, the role of Member States is further delineated in an amendment to Article 6, which establishes that the information which they are obliged to require digital platforms to furnish to their workers must, in the context of automated monitoring systems, also include details "*regarding the functioning and operational modalities of features affecting the employment*

[239] This amendment likewise underscores that, even within the context of platform work, particular importance must be attached to *"the employer's obligation to adapt work to the individual, in particular as regards the design of workplaces, the selection of work equipment, and the choice of working and production methods, with a view, in particular, to alleviating monotonous and repetitive work and reducing its impact on health."*

[240] Amendment 51**,** introducing new Recital 38a into the proposed Directive.

[241] Amendment 139 to article 7 (para.1) of the proposed Directive.

[242] Amendment 145, introducing new article 7 (para. 2-*quater*) into the proposed Directive.

[243] Amendment 52, introducing new Recital 38-*ter* into the proposed Directive.

[244] Amendment 144, introducing new article 7 (para. 2-*ter*) into the proposed Directive.

[245] Amendment 147, introducing new article 7 (para. 3-*bis*) into the proposed Directive.

relationship, in particular, as regards health and safety"[246]. Moreover, Member States must ensure the prompt provision of information and meaningful consultation with platform workers and their representatives, particularly in relation to decisions involving the implementation or modification of automated decision-making and monitoring systems that may impact health and safety[247].

It should be further noted that, when competent health and safety authorities exercise their functions to ensure effective compliance with legal obligations concerning the employment conditions of those performing work through digital platforms, and when representatives of such workers fulfil their representative duties, Member States must require digital labour platforms, irrespective of the country in which they are established, to provide such authorities and representatives with information regarding the number of persons performing work via the digital platform, their contractual status, and the applicable terms and conditions of those contractual arrangements, in compliance with the provisions of Regulation (EU) 2016/679[248][249].

5.3. ***Health and safety protection in the final text of the Directive.***

Following negotiations between the European Parliament and the Council, spanning approximately two and a half years, the final text of Directive 2024/2831 concerning the improvement of working conditions through digital labour platforms was adopted definitively on 23 October 2024. In view of the innovations introduced compared with the original proposal, this version warrants particular attention[250].

Firstly, it must be emphasised that the primary objective of the Directive is the enhancement of the working conditions of all persons engaged in activities via digital platforms within the European Union, irrespective of their employment status. It also seeks to ensure the accurate determination of their employment status, while promoting transparency, fairness, and accountability in the algorithmic management of platform-based work. Accordingly, the Directive will play a decisive role in delineating the scope of national labour regulations.

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[246] Amendment 119, introducing new point (ii-*ter*) in Article 6 (para. 2)(a) of the proposed Directive

[247] Amendment 155 to article 9 (para. 1) of the proposed Directive.

[248] Amendment 164 to article 12 (para. 1) of the proposed Directive.

[249] P. PASCUCCI, "*Dignità del lavoratore e sicurezza sul lavoro nella civiltà digitale*", Report at the conference, organized by Accademia Nazionale dei Lincei, on the topic "*Dignità del lavoro e civiltà digitale*" (Roma, 24 febbraio 2023), 2024, pp. 6-9.

[250] T. TREU, "*Diritti e politiche sociali dell'Unione Europea dopo la Conferenza sul futuro dell'Europa*", in in *Trasformazioni del lavoro*, Torino, Giappichelli, 2024, p. 368.

In this regard, following the provision of definitions for a digital labour platform and all actors involved therein in article 2, article 3 addresses the issue of the correct legal classification of such workers, drawing, in certain respects, inspiration from the Spanish *Ley Rider*[251]. Moreover, in a manner akin to Spanish legislation, article 5 of the Directive (formerly article 4 of the proposal) establishes a legal presumption of the existence of an employment relationship between the digital platform and any individual performing work via the platform, where the platform exercises control over certain aspects of the performance of the work. This obliges Member States to establish a regulatory framework ensuring the application of this legal presumption in all relevant administrative and judicial proceedings, thereby permitting supervisory authorities, such as labour inspections or social protection agencies, to rely upon it[252].

It is precisely in these circumstances that the presumption of subordination, as enshrined in the EU Directive, becomes operative, given the significant implications it may have for occupational health and safety.

In this context, it should be noted that one of the effects of such reclassification is the right to a form of minimum remuneration.

The frequently precarious nature of income, often resulting from underpayment for services rendered, exerts a considerable impact on mental health, engendering heightened stress, insecurity, and anxiety, as well as intensifying the labour performed[253].

Furthermore, in light of the prevalent piece-rate remuneration, which frequently offers no guaranteed earnings, there exists a tangible risk that some workers, particularly those engaged in transport and delivery sectors, may engage in hazardous behaviours, such as excessive speeding or disregard for traffic regulations, with potentially severe consequences for both their own physical health and that of others.

Accordingly, it is posited that adherence to fair remuneration, whether in the form of a minimum hourly rate or in proportion to the quantity and quality of work performed, could serve to mitigate such risks while simultaneously ensuring a more secure and stable income[254].

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[251] J. LAHERA FORTEZA, "*Regulacion laboral en Espana de las plataformas digitales: Presente y futuro*", in REJLSS, 2023, p. 43.

[252] D.T. KAHALE CARRILLO, "*La mejora de las condiciones de trabajo sobre las plataformas en la Uniòn Europea: consideraciones a la gestion algoritmica (salud y prevencion)*", in Revista de Investigacion de la Catedra Internacional Conjunta Inocencio III, 2023, n. 17, pp. 38-41.

[253] EU-OSHA, "*Digital platform work and occupational safety and health: overview of regulation, policies, practices and research*", in Eu-Osha, 2022.

[254] N. CHRISTIE, H. WARD, "*Delivering hot food on motorbikes: A mixed method study of the impact of business model on rider behavior and safety*", in Safety Science, 2023, 158, 105991.

Secondly, another consequential effect concerns the application of labour time regulations to these workers. In this regard, the aspect of working hours, which constitutes a pivotal factor in determining the so-called "*digital fatigue*", encompasses considerations such as the total number of hours worked, the allocation and sequencing of tasks, and the provision of rest periods throughout the working day.

It should be further noted that the organisation of working hours bears a direct relationship to the onset of certain physiological disorders, such as fatigue or stress arising from night work, which may also compromise the potential reconciliation of professional and private life[255]. Indeed, it has been observed that many platform workers, confronted with arduous working days and unfavourable schedules, with serious implications for both physical and mental health, including stress, anxiety, exhaustion, and accidents, are entitled to daily and weekly rest periods, as well as to a maximum limit on working hours, thereby mitigating such risks[256].

Thirdly, the right to be provided free of charge with appropriate personal protective equipment (PPE) emerges as a further entitlement, given that certain types of platform work entail significant physical hazards, ranging from accidents and injuries to occupational illnesses, which necessitate suitable protective measures.

This requirement has been exacerbated by the substantial financial burden previously borne by workers themselves to procure safety equipment, including helmets, lights, masks, and gloves, and to replace such items, given that platforms historically assumed no responsibility in this regard[257].

Fourthly, by virtue of the aforementioned presumption, the right to occupational health and safety training also arises, which is considered essential for the prevention of many of the professional risks described. Until now, digital platforms were not obliged to provide such training to self-employed workers, and, where they did, it was often minimal and superficial, frequently insufficient to prepare workers adequately for occupational hazards.

Fifthly, the right to social security is affirmed, aimed at safeguarding these workers, now classified as employees, against a broad spectrum of social risks linked to occupational health and safety. These risks include accidents, injuries, disability, illness, maternity and paternity leave, and old-age security.

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[255] F. TRUJILLO PONS, "*La fatiga información en le trabajo. Un riesgo nuevo y emergente: su tratamiento juridico y preventivo*", Albacete, Ed. Bomarzo, 2022, p. 321.

[256] P. BERASTEGUI, "*Exposure to psychosocial risk factors in the gig economy: a systematic review*", in ETUI Report, 2021.

[257] FAIRWORK, "*Fairwork Annual Report 2023: State of the Global Platform Economy*", Oxford, United Kingdom; Berlin, Germany, 2024.

Historically, workers classified as self-employed were frequently excluded from numerous social security schemes or enrolled in less comprehensive programmes[258]. Moreover, while platforms may offer private insurance schemes, such provisions are often significantly less generous in both coverage and duration compared with statutory schemes[259].

Sixthly, another significant consequence concerns access to protection against discrimination, as self-employed workers have traditionally enjoyed only minimal safeguards. In this regard, one of the principal risks associated with discrimination in the context of platform-based work lies in the tendency to disregard it altogether, owing to a fallacious line of reasoning: such reasoning assumes that a decision concerning an individual involves both objective and subjective elements; that discrimination arises from subjective considerations; that an algorithmic decision, by contrast, cannot be based on subjective factors; and, consequently, that an algorithm cannot discriminate.

The issue, however, stems from the very conception of discrimination, which is often confined to the individual level. Within the working environment, discrimination must instead be understood as operating on multiple levels, individual, organisational-structural, and systemic[260].

Another source of concern lies in the opacity of the digital systems employed, a problem reinforced by several interrelated mechanisms: legal constraints, such as industrial secrecy; technical barriers linked to the complexity of computational systems, which render them inaccessible to those lacking specific expertise; and deliberate obfuscation, which makes it difficult to scrutinise or interpret the software employed.

A further risk arises from what may be termed the *scale effect* of algorithmic systems, whereby computational mechanisms designed to process vast quantities of data and to assist in decision-making (for instance, promotion or task allocation) may, if discriminatory, generate harm on a correspondingly vast scale, such as the systematic denial of employment opportunities, proportional to the number of cases processed[261].

Consequently, as employees, platform workers will be entitled to the full spectrum of protection afforded by national legislation, encompassing grounds such as age, gender, race, sexual orientation, religion or belief, and disability.

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[258] ISSA, "*Social security for the self-employed -in Europe: Progress and developments*", in ISSA, 2024.
[259] FAIRWORK, "*The Gig Economy and Covid-19: Looking ahead*", Oxford, United Kingdom, 2020.
[260] L. E. EDGE, R. J. WALKER, J.S. WILLIAMS, "*Addressing Structural Inequalities, Structural Racism, and Social Determinants of Health: a Vision for the Future*", 2023; EU-OSHA, "*The EU Directive on platform work: improvements and remaining challenges related to occupational safety and health*", in Eu-Osha, 2024.
[261] P. RIVAS VALLEJO, "*Discriminacion algoritmica en el ambito laboral: perspectiva de genero y intervencion, Pamplona*", Thomos Reuters Aranzadi, 2022, p. 75.

Seventhly, attention must also be drawn to the right to clear and transparent contractual terms. Whereas contracts governing self-employed workers are generally regulated by commercial law, employment contracts fall within the ambit of labour law. This ensures that the mandatory information to be provided is rigorously prescribed, thereby reducing the ability of digital platforms to evade certain duties and liabilities, including those relating to occupational health and safety, while at the same time enhancing contractual transparency and facilitating workers' access to legal remedies in the event of contractual breaches[262].

It thus becomes apparent that the *asymmetrical configuration* of the contractual relationship between the platform and the worker reveals a pronounced imbalance in the synallagmatic nature of the employment relationship.

The Directive, therefore, seeks to ensure the application of the standard labour-law protections, together with the OSH safeguards introduced by the Platform Work Directive itself, without the need to resort to the creation of an intermediate legal category, given the adaptability of the fundamental notions of subordination and of algorithmic governance within the employment context.

With regard to the element concerning the burden of proof, it should be clarified that the presumption of the existence of an employment relationship transfers onto the platform the responsibility of demonstrating the non-subordinate nature of the work performed.

In other words, the platform must prove that those providing distribution and delivery services through it are not, in fact, employees. For this reason, digital platforms, in their attempts to minimise their role as employers, frequently resort to informal and precarious labour practices, or to alternative contractual arrangements such as workers' cooperatives[263] or subcontracting schemes, with the aim of avoiding certain obligations, notwithstanding the fact that the Directive expressly seeks to curb such tendencies[264].

However, given the manner in which managerial and supervisory powers are exercised, often indirectly or implicitly, it will be exceedingly difficult for platforms to evade the application of the aforementioned legal framework. It is therefore foreseeable that disputes concerning the regulation of labour in this sector will continue to proliferate, both collectively and before the courts, thereby revealing the strategic nature of this issue in reshaping the cultural and

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[262] EU-OSHA, "*The EU Directive on platform work: improvements and remaining challenges related to occupational safety and health*", in Eu-Osha, 2024.

[263] A. BAYLOS GRAU, "*A brief note on the Spanish law on the employment of riders*", in LLI, 2021, vol. 7, 1, p. 1 ss.

[264] A. ESTEVE SEGARRA, A. TODOLÌ SIGNES, "*Cesión ilegal de trabajadores y subcontratación en las empresas de plataforma digital*", in Revista de Derecho Social, 2021, 95, pp. 37-64.

ideological discourse surrounding digitalisation and its supposed incompatibility with the formalisation of work.

As regards the question of subcontracting, it is important to note that article 3 of the Directive stipulates that individuals performing platform work through intermediaries are exposed to the same risks, previously analysed, as those that may arise from the misclassification of their employment status and from the use of automated monitoring or decision-making systems. This is equally the case for those who provide platform work directly for a digital labour platform.

Member States should therefore adopt appropriate measures to ensure that, under the present Directive, such persons enjoy an equivalent level of protection, including occupational health and safety safeguards, as those performing platform work under a direct contractual relationship with the digital labour platform. This should also include suitable mechanisms such as, where appropriate, joint and several liability schemes[265].

With specific regard to algorithmic management, the Directive introduces a series of safeguards governing the use of such systems, while at the same time improving psychosocial working conditions, for example, by mitigating perceptions of organisational injustice, rebalancing power asymmetries, and enabling workers to exercise a degree of control over their own work. These are all recognised risk factors associated with algorithmic management in platform-based labour.

First and foremost, the Directive, following the provisions set out in articles 7, 8 and 9, which establish limitations on the processing of personal data when automated monitoring and decision-making systems are employed, as well as the requirement to conduct an impact assessment of such processing, requires digital labour platforms to provide detailed information regarding the use of automated decision-making systems. This obligation effectively remedies, as previously noted, the informational shortcomings identified in the Spanish *Ley Rider*.

According to paragraphs 1 and 2 of article 9 of the Directive, such information must be presented "*in a transparent, intelligible and easily accessible manner, using clear and plain language*", as also required by article 12 (para. 1) of the *GDPR*, and must be made available to workers, their representatives, and the relevant national authorities prior to the

[265] COUNCIL OF EUROPEAN UNION, "*Proposal for a directive of the European Parliament and of the Council on improving working conditions in platform work - Analysis of the final compromise text with a view to agreement*", in Eur-lex, 2024.

implementation of the system. In doing so, the Directive resolves the temporal gap that the *Ley Rider* had left unaddressed concerning the timely provision of such information.

This provision may enable the various stakeholders to access the information necessary to assess any adverse impacts arising from the use of automated decision-making in terms of occupational health and safety, such as excessive workloads or discriminatory practices. At the same time, it contributes to reducing power asymmetries between platforms and workers, allowing the latter to gain greater clarity regarding the processes and outcomes of automated decisions.

Secondly, pursuant to article 10 (para. 1) of the Directive, the use of automated decision-making must be subject to human supervision and evaluation, particularly with regard to its impact on working conditions and workplace discrimination.

Furthermore, paragraph 2 of the same article provides that adequate resources must be made available to ensure that the individual responsible for such oversight possesses the requisite training and competence and may, where necessary, annul automated decisions. This enables a genuinely human assessment of automated decisions, including their effects on health and safety, and, where an unacceptable risk is identified, allows for the modification or suspension of the automated system.

It should also be noted that human supervision can play a decisive role in improving psychosocial working conditions, and in particular, the perception of organisational fairness and the balance of power within the employment relationship. Procedural opacity has frequently been employed by platforms to circumvent negotiation and to impose unfair practices on a "*take-it-or-leave-it*" basis[266].

Thirdly, under article 11 (para. 1), workers are granted the right to obtain an explanation of any decision made or supported by an automated process, and to request a human review of that decision[267]. This provision strengthens workers' autonomy vis-à-vis automated decision-making and may contribute to mitigating OHS-related risks associated with such processes. It is capable of rebalancing power asymmetries and enhancing workplace fairness, while also enabling workers to exercise a measure of control over their own work, particularly by responding to unfair decisions.

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[266] EUROPEAN PARLIAMENT, "*Update the unfair contract terms directive for digital services*", in European Parliament, 2021, p. 15; H. W. MICKLITZ, "*Reforming European unfair terms legislation in consumer contracts*", in ERCL, Vol. 4, 2010, pp. 347–383.

[267] EU-OSHA, "*Digital platform work and occupational safety and health: overview of regulation, policies, practices and research*", in Eu-Osha, 2022.

Indeed, one of the principal sources of frustration and anxiety reported by platform workers lies in their lack of recourse against unjust platform decisions or inappropriate customer behaviour[268].

Fourthly, there exists a specific section devoted to health and safety in article 12 (para. 1), which requires digital labour platforms to assess the risks arising from automated decision-making and monitoring systems in relation to occupational health and safety. Particular attention must be paid to ergonomic and psychosocial risks, as well as to occupational injuries. Platforms are also required to evaluate the adequacy of the safeguards implemented for such systems, taking into account the particular characteristics of the working environment, and to introduce appropriate preventive and protective measures.

To this end, paragraphs 2 to 5 of the same article provide, *inter alia*, for a prohibition on the use of such systems where they may endanger the physical or mental health of workers (paragraph 3), for the obligation to inform and consult platform workers (as also provided in articles 13 and 14), and for the establishment, by Member States, of reporting channels to be maintained by platforms. These obligations apply equally to any modification or alteration of the automated decision-making system, as well as to its use in preventing specific incidents such as acts of violence or harassment.

Lastly, it should be emphasised that digital labour platforms often suffer from a lack of transparency and accountability, which makes it difficult for public authorities to obtain information concerning workers and their working conditions. In this respect, platform workers frequently struggle to exercise their rights, including those relating to health and safety, owing to the absence of adequate information and communication channels, an issue that can itself generate stress and anxiety.

To address these shortcomings, article 17 (para. 1) of the Directive introduces a series of measures requiring platforms to provide authorities with data on workers, working hours, earnings, and working conditions.

6. The continuing relevance of directive 89/391/EEC in upholding health and safety standards for workers on digital platforms.

Continuing along the line of protection established under paragraph 2 of article 7 of the proposed Directive (article 12, paragraph 1, letters a), b), and c) in its final version), it may be

[268] P. BERASTEGUI, "*Exposure to psychosocial risk factors in the gig economy*", *cit*.

observed that, in the implementation of a regulatory framework at EU level, the provisions of the aforementioned Directive 89/391/EEC could find meaningful integration. By focusing on a risk-based model and on the identification of a general duty of care, one that evolves in tandem with scientific and technological progress, this Directive is fully capable of making a significant contribution, in conjunction with the other regulatory systems examined thus far, towards addressing the challenges posed by artificial intelligence systems and by the use of algorithmic or automated systems within the world of work[269].

As highlighted in the preceding sections, the profound impact of the introduction of new technologies manifests itself both in the creation of physical risks to which workers may be exposed when interacting with such systems, and in psychosocial risks arising from organisational transformations; these latter risks, moreover, are not exempt from procedural difficulties in terms of risk management.

In reality, the principal issue does not so much concern a departure from the traditional space–time parameters of performance (as is the case with remote or "smart" working[270]), nor the organisational flexibility that influences the classification of the employment relationship (as in the context of digital platform work[271]), but rather the profound impact that new technologies exert upon the organisation of work itself, an impact that, as previously noted, generates considerable risks, particularly of a psychosocial nature.

Among these, one may certainly include that of job insecurity, whereby, owing to the reduced human involvement in the operation of automated systems, workers may develop an apprehension of losing their employment or of being replaced altogether, accompanied by potential difficulties in reskilling (especially in relation to ageing workforces[272]) and, ultimately, the spectre of technological redundancy.

Nor should one overlook the persistent imbalance perceived by the worker between the effort required by the workload imposed and the almost total absence of participation in the decision-making process, owing to the particular intrusiveness that characterises control systems within the automated structures of new organisational models[273].

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[269] A. TODOLI'-SIGNES, "*Making algorithms safe for workers: occupational risks associated with work managed by artificial intelligence*", in Transfer, 2021, 27(4), pp. 433 ss.

[270] M. TIRABOSCHI, "*Il lavoro agile tra innovazioni tecnologiche e dinamiche sociali. Contributo e limiti del punto di vista giuridico*", in R.S. DE CASTRO-P.MONDA (a cura di), *Il lavoro a distanza: una prospettiva interna e comparata*, in Quaderno della Rivista Diritti Lavori Mercati n. 13, Ed. Scientifica, Napoli, 2023, pp. 87 ss.

[271] F. MALZANI, "*Salute e sicurezza dei lavoratori della gig economy*", in P. PASCUCCI (a cura di), Salute e sicurezza sul lavoro, Franco Angeli, Milano, 2019, pp. 45 ss.

[272] M. BROLLO, "*Tecnologie digitali e nuove professionalità*", in DRI, 2019, pp. 468 ss.

[273] M. PERUZZI, "*Intelligenza artificiale e lavoro. Uno studio su poteri datoriali e tecniche di tutela*", *cit*., pp. 75-80.

These models, moreover, if not properly implemented, as in the case of remote work, detached from a precise temporal framework for the performance of duties, may well entail the risk of generating uncertainty concerning roles, responsibilities, and assigned tasks.

Human relations within the workplace also play a significant role, yet they are liable to be diminished by the pervasive presence of technological tools in the working environment (as exemplified by workers' interactions with machines in the case of cobots).

While this may, on the one hand, reduce the incidence of interpersonal conflicts, harassment, or other forms of violence perpetrated by humans, on the other, it may give rise to new risks, such as social isolation, particularly where human resource management focuses excessively on the individual, or to undue intrusions into workers' private lives, which stand in stark contrast to the ideal of work–life balance[274], and which are largely caused by the spatio-temporal flexibility inherent in digitalisation.

Continuing with the discussion of psychosocial risks, particularly those stemming from the content of work itself, it should be noted that technological innovation, far from prompting a "redefinition" of subordination towards a more dynamic model based on autonomy, participation, cooperation, and accountability[275], may instead exacerbate the monotony of tasks, diminish their professional value, and lead to the deterioration of acquired skills, largely owing to the lack of adequate training.

Furthermore, the very increase in work activity resulting from the use of automated systems may generate substantial risks, aggravated by intrusive and real-time monitoring of workers' performance[276], such as conflicts between imposed demands and available resources, the need for sustained concentration, the absence of feedback, and issues relating to workload and work pace. These, in turn, may lead to tighter control over performance, irregular distribution of tasks, inflexibility, or excessively long working hours.

In light of the foregoing, and in order to establish appropriate protective measures through the potential interaction of different regulatory frameworks, it may be observed that the employer's use of algorithmic systems in the exercise of managerial prerogatives can be classified, in accordance with the *GDPR*, as a form of automated data processing.

This processing concerns, on the one hand, the profiling of workers, which may affect or alter their legal position, and, on the other, the automated decision-making and monitoring processes themselves, in which the data used relate to particularly vulnerable interests.

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[274] L. CALAFA', "*La conciliazione vita e lavoro in ambiente digitale*", in Federalismi, 2022, 34, p. 203.
[275] L. CORAZZA, "*Note sul lavoro subordinato 4.0*", in DRI, 2018, 4, pp. 1066 ss.
[276] A. ALLAMPRESE, O. BONARDI, "*Studio sulle condizioni di lavoro nella logistica: tempo e salute*", in DSL, 2020, 2.

Such a qualification implies both the inclusion of the matter within the scope of the *GDPR* and the employer's obligation to conduct a *Data Protection Impact Assessment* (*DPIA*) pursuant to article 35 *GDPR*. This obligation entails the establishment of a system for assessing and managing risks in order to ensure the adoption of adequate measures for the protection of all fundamental rights of the workers concerned, and to guarantee that data processing complies with the principles, particularly transparency, set out in the *GDPR*.

This process must take due account of the involvement of workers and their representatives, and, above all, of instruments such as the code of conduct (article 40) and collective agreements (article 88), for the purpose of determining the adequacy of organisational decisions.

Where the automated processing is managed by an algorithm classified as an AI system under the AI Regulation, it should be clarified that certain principles concerning the role of the user become incorporated into the *DPIA* obligation under article 35.

In this regard, the user is required to organise resources so as to adopt measures ensuring the human oversight prescribed in the system's operating instructions. Since, under the AI Regulation, human oversight is intended to prevent or mitigate risks of rights violations (article 14 (para.2)), such oversight forms an integral part of the risk management dimension envisaged by the *DPIA*, indeed, a multi-level dimension of human supervision, whereby measures are established to address risks that may impinge upon the rights and freedoms of data subjects.

Conversely, the knowledge the user may derive from the operational instructions provided by the supplier complements both the informational prerequisites needed to gather the views of workers and their representatives, and the substance of the protective measures designed to ensure that automated processing fully complies with the principles of fairness and transparency enshrined in the *GDPR*, and more broadly, with the protection of fundamental rights and freedoms, foremost among them human dignity. From a specifically labour law perspective, the two Regulations, the *GDPR* and the AI Regulation, intersect with the occupational health and safety framework, which is designed to promote and ensure appropriate procedures for risk assessment and management aimed at safeguarding workers' physical, mental, and social well-being. In particular, with respect to human oversight, this framework establishes the obligation to adopt adequate preventive measures against sources of risk, as well as systems for verifying the appropriateness of such measures, both of which, as noted above, must duly take into account scientific and technological developments.

With regard to transparency, downstream obligations concern the provision of information, training, and instruction to workers on potential risks, while upstream obligations relate to forms of collective participation, such as the duty to consult specialised workers' representatives (insofar as article 6 (para. 3)(c) of Directive 89/391/EEC requires the assessment of the effects that the implementation of new technological systems may have on workers' health and safety), the delivery to such representatives of the risk assessment report, accompanied by its supporting documentation, and the duty to identify preventive and protective measures, the procedures for their implementation, and the organisational roles responsible for ensuring their execution[277].

7. The collective dimension of worker protections.

Resuming the discussion from a participatory and inclusive perspective concerning the protection of workers' rights in the presence of automated systems within the workplace, it may first be observed that, under the *GDPR*, as previously examined, whenever an automated process is introduced to support the exercise of managerial prerogatives, the employer is required to carry out a *Data Protection Impact Assessment* (*DPIA*).

In conducting such an assessment, it is both appropriate and advisable to involve the representatives of the data subjects (the workers), to take due account of their views, and to provide a reasoned and detailed explanation should the employer's final position deviate from those views.

Having established this premise, the regulatory framework underlying the GDPR also envisages the possibility for trade unions, acting under a mandate pursuant to article 80, to bring a representative action. Such an action may be based either on the processing of the personal data of workers granting the mandate[278] or on breaches of the fundamental principles designed to safeguard such principles including lawfulness, transparency, purpose limitation, and data minimisation, as well as the employer's obligations concerning the DPIA and the rights of information[279]. This representative action may take the form of judicial proceedings

[277] M. PERUZZI, "*Intelligenza artificiale e lavoro. Uno studio su poteri datoriali e tecniche di tutela*", *cit*., pp. 75-80.

[278] Furthermore**,** article 80 (para. 2) confers upon the Member States the discretion to grant the representative body the right to act in its own name.

[279] In this regard, particular attention is drawn to the three judgments of the Court of Appeal of Amsterdam of 4 April 2023, concerning the cases of Uber and Ola drivers. Notably, although these were not actions pursuant to article 80 *GDPR*, and notwithstanding the significant role played by the *ADCU* union, which represents the interests of private hire drivers and couriers in the United Kingdom and is affiliated with the *International Alliance of App Transport Workers* (IAATW), the Court essentially underscored the union's function in

under articles 78, 79, or 82, or of a complaint lodged with the Data Protection Authority pursuant to article 77, thereby ensuring access to judicial[280] or, alternatively, administrative remedies[281].

Within this framework, due regard must also be given to the pivotal role played by occupational health and safety law. Workers' representatives benefit from a particular channel of access, through their information rights, to the employer's risk assessment documentation. They are likewise entitled to prior consultation, of a general nature when new technological systems are introduced into the organisation of work, and of a specific nature when the assessment concerns all risks, both physical and psychosocial, that may adversely affect workers' health and safety.

In this regard, the proposed Directive on platform work also assumes particular significance. As reflected in the European Parliament's amendments, collective aspects related to the obligation to conduct impact assessments under the *GDPR* have now found explicit normative recognition. Specifically, with the addition of a further paragraph to article 6 (on transparency obligations), the Directive requires platforms to carry out a data protection impact assessment, accompanied by a consultation of the data subjects or their representatives.

It should be noted that the information relating to such assessments must be provided "*in a concise, transparent, intelligible and easily accessible form, using clear and plain language*", thereby enabling workers and their representatives "*to prepare, where necessary, for the consultation process*".

Furthermore, under the aforementioned proposal, and without prejudice to the action provided for in Article 80 of the *GDPR*, there is provision for the possibility of bringing a collective action. In this respect, article 15 imposes on platforms, as a prerequisite for the exercise of

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safeguarding the digital rights of platform workers. Moreover, *ADCU* is supported by *Worker Info Exchange* (WIE), a non-profit organisation whose objectives include providing information economy workers with access to personal data collected in the workplace. In pursuance of this aim, *ADCU* and *IAATW* are to establish a database managed by WIE, which will contain the personal data of the drivers.

[280] C. CIMAROSSA, "*Artt. 77-79*", in G. M. RICCIO, G. SCORZA, E. BELISARIO, GDPR e normativa privacy. Commentario, Wolters Kluwer, Milano, 2018, pp. 582 ss., The action pursuant to Article 79 GDPR serves both to secure compensation under Article 82 and to prevent the continuation of conduct contrary to the provisions of the GDPR. With specific regard to Article 82 GDPR, attention is drawn to the judgment of the Court of Justice of 4 May 2023, Oesterreichische Post, C-300/21, ECLI:EU:C:2023:370. In this case, the Court clarified that the concepts of "material or non-material damage" and "compensation for damage" constitute autonomous notions under EU law and must be interpreted uniformly by the Member States (paragraph 30). Furthermore, the Court outlined three cumulative conditions that must be satisfied in order to establish the right to compensation: the existence of damage that has been suffered, the occurrence of a *GDPR* infringement, and a causal link between the damage and the infringement (paragraph 32).

[281] In such circumstances, article 58 of the *GDPR* delineates the powers of the supervisory authority, including the authority to require the data controller to comply with requests from the data subject regarding the exercise of their rights, to bring processing activities into conformity with the Regulation, and to impose restrictions or a prohibition on processing.

such an action, the obligation to ensure, while simultaneously prohibiting any interference on their part, the creation of a digital space designed to facilitate communication channels among workers. These channels must enable workers to communicate with one another and to be contacted by their representatives[282].

In addition, among the European Parliament's amendments, article 6a stipulates that Member States must ensure that, in the context of information and consultation processes, workers' representatives and the experts assisting them are prohibited from disclosing any information provided to them that is of a confidential nature.

The criteria for determining such confidentiality, as well as its duration, are to be specified by national legislation and by the platform itself. However, the representatives retain the right to request an administrative or judicial review of such classification; this obligation of confidentiality is justified by the protection of the undertaking's legitimate interests, unless the information in question concerns the working conditions of the workers or rights guaranteed by the Directive itself, and provided that the exchange of such information occurs among representatives, works councils (whether European, national, or local), and the relevant trade unions.

Having examined the collective protection mechanisms envisaged under the proposed Directive, it is worth noting that both the *GDPR* and Directive 89/391/EEC have likewise played a significant role in ensuring the effective participation of workers within the enterprise, interacting with other EU instruments governing the involvement of workers in corporate decision-making processes.

Among these instruments, particular reference should be made to Directive 2002/14/EC, which concerns workers' rights to information and consultation in undertakings with more than fifty employees. Pursuant to article 4 (para. 2)(a) and (c) of that Directive, due account must be taken of the overall situation of the undertaking's activities, including technological innovations and business decisions capable of producing substantial changes in the organisation of work[283].

Equally relevant is Directive 2009/38/EC, concerning the establishment of a European Works Council or a procedure for informing and consulting employees in Community-scale undertakings and groups of undertakings, as well as the twin Directives 2001/86/EC and

[282] G. GOSETTI, "*Lavoratori, sindacato e digitalizzazione*", Franco Angeli, Milano, 2022.
[283] I. SENATORI, "*Eu Law and digitalization of employment relations*", in T. GYULAVARI, E. MENEGATTI, Decent work in the digital age, Hart Publishing, 2022, pp. 57 ss.

2003/72/EC, which address the participation of workers respectively in the *European Company* (SE) and in the *European Cooperative Society* (SCE)[284].

Of particular importance within the framework of the 2002 Directive is the right of workers' representatives both to express an opinion and to receive a reasoned response, rights which, as previously noted, also characterise the impact assessment procedure set out in article 35 of the *GDPR*. Equally significant is article 6 of the same Directive, which governs the handling of confidential information, in a manner consistent with the corresponding provision of the Directive on digital labour platforms.

That said, although numerous points of intersection can be identified among the legal frameworks concerning personal data protection, occupational health and safety, and workers' participation, it must be clarified that these regimes are not entirely overlapping. Unlike the third, the first two are not subject to the attainment of a specific workforce threshold within the undertaking.

Where, however, all three regimes are simultaneously applicable, it becomes possible to explore the various modalities of their interaction, beginning, in the first instance, with the extent to which the *GDPR* influences the procedures described in the 2002 Directive, particularly in relation to assessing the adequacy and methods of workers' information and consultation.

One may further question the interaction between such procedures and the obligation to carry out a *Data Protection Impact Assessment* (*DPIA*) pursuant to article 35 of the *GDPR*, particularly insofar as the controller must first seek the opinion of the representatives of the workers concerned, who are also the data subjects, and provide a reasoned response thereto. Failure to comply with these procedural requirements may, in certain circumstances, amount to an anti-union practice.

In the latter case, recourse to judicial proceedings could be sought, for instance, through the mechanisms established under the *GDPR*, by means of a representative action brought under a mandate pursuant to article 80. Such an action would aim to remedy violations of individual rights to information or access, breaches of the *DPIA* obligation, or failures to ensure compliance and the protection of workers' rights that the controller is required to guarantee through an adequate impact assessment procedure. This form of action may only be brought upon delegation and not *iure proprio* by the trade union.

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[284] A. ALAIMO, "*Il coinvolgimento dei lavoratori nell'impresa: informazione, consultazione e partecipazione*", in S. SCIARRA, B. CARUSO (a cura di), Il lavoro subordinato, Giappichelli, Torino, 2009, pp. 641 ss.

Moreover, given the nature of the representative body entitled to bring the claim, it differs substantially from the collective anti-discrimination action, which constitutes one of the legitimate avenues of redress available to trade unions.

The latter, unlike the former, may be exercised *iure proprio* by the representative entity itself[285], independently of the identification of the individual right-holder, insofar as personal data may be deemed to relate to an identifiable person, even indirectly.

Lastly, with regard to collective action, reference should also be made to the proposed Directive on digital labour platforms, article 14 of which provides for the possibility of representative actions to be brought under mandate by representative entities holding a legitimate interest in the protection of workers' rights, in accordance with national legal systems[286].

Specifically, such entities may act on behalf of, or in defence of, one or more individuals, with their consent, thereby giving rise to a form of voluntary procedural representation, namely, an *intervention ad adiuvandum*. As Recital 44 makes clear, this mechanism "*facilitates proceedings that would otherwise not be initiated due to procedural or financial obstacles, or for fear of retaliation*"[287].

To complete the picture, it should be observed that the proposed Directive, much like the anti-discrimination Directives, contains no explicit provision allowing representative actions to be brought in the absence of a mandate[288].

In this respect, the case-law of the Court of Justice concerning anti-discrimination Directives[289] confirms that Member States are free to introduce more favourable provisions under article 20, thereby granting representative bodies standing to act without mandate, either as procedural substitutes for the right-holders or as entities entitled to bring an action

[285] V. PROTOPAPA, "*Uso strategico del diritto e azione sindacale*", il Mulino, Bologna, 2022.

[286] Within the European Parliament's proposed amendments, Article 14 notably highlights the role of trade unions and provides for the possibility of initiating a representative action without a mandate.

[287] The proposal, in its provisions concerning the right to individual recourse and the possibility of procedural representation by organisations, establishes a specific link with the *GDPR*, without prejudice to the Regulation's rules on actions against the data controller, the right to compensation, and the representation of data subjects, including representative actions by organisations, whether with or without a mandate.

[288] As previously noted, among the European Parliament's amendments to the proposal is the provision allowing for representative action without a mandate, specifically envisaging that organisations may act with the approval of the concerned parties "*where appropriate*," while preserving "*other powers and collective rights of the social partners and worker representatives, where applicable, including the right to act in the name of a collective interest in accordance with national legislation or practice*".

[289] CJEU, 23 April 2020, NH v. Associazione Avvocatura per i Diritti LGBT – Rete Lenford, C-507/18, ECLI:EU:C:2020:289.

iure proprio for the protection of a collective interest or of the interests of a homogenous group of individuals, even if not individually identifiable[290].

8. ***The legal characterisation of digital platforms by the Court of Justice of the European Union: balancing intermediation and work organization.***

Finally, should one wish to anticipate the highly significant issue concerning the legal classification of work performed through digital platforms, which will be addressed in the following chapter, it is necessary first to ascertain how the Court of Justice of the European Union has legally framed digital platforms, a matter that clearly carries significant implications for the nature of the work performed by platform workers.

When the term "platform" is invoked, it should be noted that certain enterprises have sought, particularly in the eyes of investors, to present themselves as mere spaces in which particular actors, known as users, are facilitated in making connections (so-called *matching*) through sophisticated and efficient computational and information systems, thereby conducting commercial transactions; this, in turn, allows platform operators to obscure their role as the economic agents ultimately responsible for these transactions[291].

Moreover, given that the cohesion of a given economic entity is undermined when its activities are not executed in a single location or are characterised by irregularity, a digital platform cannot be understood merely as a neutral space for market interactions. Rather, the rules governing such exchanges are effectively dictated by the platform itself through its standard contractual terms.

The so-called "autonomy" of workers in performing their tasks has also been the subject of significant jurisprudence, most notably in the case of *Elite Taxi*, reviewed by the CJEU, which considered the uncertain classification of the *Uber* platform either as a mere provider of information society services or as a producer of digital services[292].

Although the ruling did not directly address the employment relationships of *Uber* drivers, it affirmed that the platform exerts a substantial influence on their working conditions, setting

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[290] M. PERUZZI, "*Intelligenza artificiale e lavoro. Uno studio su poteri datoriali e tecniche di tutela*", *cit*., pp. 83-94.

[291] S. FISHMAN, B. GOMES, "*Intelligence artificielles et droit du travail: contribution à l'étude du fonctionnement des plateformes numérique*", in P. Adam, M. Le Friant, Y. Tarasewicz (a cura di), Intelligence artificielle, Gestion du personnel et droit du travail, Dalloz, 2020, pp. 37 ss.

[292] CJEU, 20 December 2017, C-434/15, *Elite Taxi*; similarly, CJEU, 10 April 2018, C-320/16, *Uber France SAS*.

maximum fares, collecting payments from clients and remitting a percentage to drivers, monitoring vehicle quality, and overseeing driver conduct.

This demonstrates the inseparable connection between the digital instruments employed by the platform and the labour performed by drivers[293].

More specifically, this organisational model appears to be predominant in the urban passenger and freight transport sector, where the entrepreneur achieves their economic and productive objectives through the presence of a digital platform within their operational structure.

Furthermore, the entrepreneur, taking advantage of an available workforce that substantially exceeds the service requirements, tends to avoid establishing continuous employment relationships, instead opting for arrangements characterised by irregularity and intermittence, while relying on the platform's own selection mechanisms to recruit labour.

Although this may appear to be the product of a preference for the so-called "*market model*" over the "*enterprise model*", whereby digital tools are employed to source a broad pool of users or workers in order to secure the necessary labour without incurring the costs associated with ownership of production factors (in this case, continuous employment relationships), in reality, digital platforms aim to coordinate both technological and human resources in a centralised and unified manner. In doing so, they effectively constrain the scope of market mechanisms as well as competition among operators, whether based on service quality or pricing[294].

Within this context, the performance of work assumes a highly distinctive character, diverging significantly from the exercise of typical managerial authority or the coordination characteristic of autonomous collaborations. As has been observed in previous chapters, platforms frequently employ *nudging* techniques[295], both promotional and punitive, to encourage workers to accept all available opportunities, thereby securing a continuous availability of their labour.

Furthermore, incentive systems are deployed to allocate tasks, guiding workers towards behaviours that meet the platform's requirements regarding availability and conduct. Another

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[293] See also the order of the Tribunal of Milan, Special Business Section, 9 July 2015, in RIDL, 2016, II, pp. 46 ff., concerning the injunction against *Uber Pop*, defining *Uber*'s activity as "*inseparably connected to the activities of individual drivers*".

[294] J. TOMASSETTI, "*Does Uber redifine the Firm? The postindustrial corporation and advanced Information technology*", in HLELJ, 2016, 34, p. 1 ss, in part., pp. 54 ss.

[295] The verb "to nudge" was also employed by the European Commission in the document *First phase consultation of social partners under Article 154 TFEU on possible action addressing the challenges related to working conditions in platform work*, C(2021) 1127 final, pp. 5 ff. A more sophisticated theory of nudging was developed by R.H. THALER, "*Libertarian paternalism is not an oximoron*", in UCLR, 2003, 70, 4, pp. 1159 ss.

key instrument is the monitoring of work activity, which serves to align performance with the organisational framework constructed by the platform.

This allows, for example, the allocation of tasks according to geographic location without establishing a formal employment relationship.

Conversely, other platform models exhibit a markedly weaker influence over workers' activities, as the service provided consists merely of making a digital service available through a relatively minimal organisational structure; in such cases, where contracts are concluded with minimal or no interference from the platform, the latter assumes the role of an economic intermediary between clients and service providers or workers.

These distinctions were further clarified in the Court of Justice ruling on *Airbnb*[296].

Although the company simply facilitates short-term property rentals, the judgment illustrates the differences between platforms that intermediate services autonomously provided by small entrepreneurs or self-employed workers, and those that organise the labour of others. According to the Court, *Airbnb* does not supply accommodation per se but rather provides a "*structured list of available accommodations (...) corresponding to the criteria selected by those seeking short-term lodging*", which is necessary to facilitate contract conclusion[297], rather than for the actual provision of the accommodation service, since property owners may use alternative channels[298].

Moreover, *Airbnb* does not set accommodation prices, merely offering a pricing estimate based on platform trends, leaving the final decision to the *host*[299].

Consequently, where the platform does not exert control over service delivery, it functions purely as a digital intermediary. In accordance with Directive 2000/31/EC (the *E-Commerce Directive*), it cannot be constrained in its freedom of establishment, and it may also be governed by other regulations within the *Digital Single Market*, such as Regulation 2019/1150/EU, which enshrines principles of fairness and transparency for commercial users of online intermediation services.

Accordingly, the Court concluded that *Airbnb* hosts are not to be legally classified as either employees or self-employed individuals of the platform but rather as clients utilising a service

[296] CJEU,19 December 2019, C-390/18, *Airbnb Ireland*.
[297] p. 53 of the judgment.
[298] p. 55 of the judgment.
[299] p. 56 of the judgment.

to facilitate property rentals[300], a position also reflected in the proposed Directive on improving platform work conditions[301].

In such instances, platforms primarily provide a service oriented towards the sharing or exploitation of assets, where the organisation of labour is merely instrumental and of secondary significance.

As a result, labour protection measures relating to the existence of an employment relationship, and to a lesser extent to individuals working via platforms, are generally excluded from the regulatory scope[302].

8.1. ***The legal status of gig economy workers: the European Court of Justice's formalistic approach in the Yodel case.***

To complement the discussion thus far, it is necessary to examine a seminal case concerning the legal classification of Gig economy workers, specifically the judgment of the Court of Justice of the European Union (CJEU) of 22 April 2020, which resolved a dispute between a courier of the Yodel Delivery Network and the Employment Tribunal of *Watford* in the United Kingdom[303].

The focus lies primarily on the interpretation of the notion of "*worker*"[304] within both European and British law, in light of the transformations brought about by the Gig economy, a phenomenon, as previously noted, that is increasingly prevalent and characterised by non-standard and highly flexible forms of employment.

The case arose from a preliminary reference by the UK tribunal regarding the legal status of an individual working via a digital platform, specifically whether such a person should be regarded as subordinate or self-employed, two categories which entail markedly different levels of legal protection and social rights.

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[300] Clearly, beyond the primary activity related to rental, ancillary tasks such as cleaning and guest reception must also be considered, with distinctions drawn depending on whether these are performed directly by the host or by other parties.

[301] COM(2021) 762; see also M. BARBIERI, "*Prime osservazioni sulla proposta di direttiva per il miglioramento delle condizioni di lavoro nel lavoro su piattaforma*", in LLI, 2021, 7, 2, p. 1 ss.

[302] A. DONINI, "*Piattaforme*", in Lavoro digitale, M. NOVELA, P. TULLINI (a cura di), Giappichelli, Torino, 2022, pp. 29-33.

[303] CJEU, 22 april 2020, C-692/19, B. v Yodel Delivery Network Ltd.

[304] J. A. PRASSL, A. ALOISI, N. COUNTOURIS, V. DE STEFANO, "*Eu Court of Justice's decision on employment status does not leave platforms off the hook*", Regulation for Globalization, 29 aprile 2020, where "*workers, in the UK, are not employees under a contract of employment but rather a broader and intermediate category, including some self-employed, who provide personal work and services to another party, who is not a mere customer or client*".

The UK judge sought guidance from the CJEU on whether a person working for Yodel, a platform operating in the delivery sector, should be considered a "*worker*" under European Union law, or rather classified as self-employed.

The reference[305] particularly concerned the interpretation of Directive 2003/88/EC, which establishes working time provisions applicable to so-called "*workers*".

The Court, favouring a formal and contractual approach in interpreting employment relationships, focused primarily on elements of flexibility and autonomy.

Essentially, the courier had the freedom to choose when and how many hours to work, could refuse assignments, and could arrange for substitutes, factors the Court considered indicative of an absence of the typical subordination characteristic of dependent employment.

In this respect, the Court held that the platform's powers of control and direction were not sufficiently pervasive to constitute a genuine employment relationship.

In essence, the crux of the decision centres on the notion of "*worker*" or "*employee*", which, it should be noted, does not entirely coincide with the corresponding figure under UK law, possessing a specific meaning[306] within the European Union context that invites broader reflection beyond the case at hand.

A preliminary point to consider is that EU law does not provide a unified definition of "*worker*"[307]. The closest reference is article 45 of the Treaty on the Functioning of the European Union (TFEU), which concerns the free movement of workers within the internal market, but does not furnish a precise definition of the category[308].

Nonetheless, EU law seeks to distinguish between employees and the self-employed primarily to secure access to free movement within the internal market, rather than to regulate the protective rights afforded to workers[309].

It should also be emphasised that the concept of "*worker*" at the European level is not explicitly derived from the legislation[310], but has been developed by the CJEU[311] through an

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[305] EUROPENA COMMISSION, "*Interpretative Communication on Directive 2003/88/EC of the European Parliament and of the Council concerning certain aspects of the organisation of working time*", in European Commission, in Eur-lex, 2017.

[306] A "*genetic peculiarity*", according to S. GIUBBONI, "*Diritto del lavoro europeo*", Cedam, 2017, pp. 121-170, here p. 123.

[307] S. GIUBBONI, "*Per una voce sullo status di lavoratore subordinato nel diritto dell'Unione europea*", in RDSS, 2018, 2, pp. 207- 227, here, pp. 207 e 226.

[308] E. MENEGATTI, "*The Evolving Concept of "worker" in Eu law*", in ILLEJI, 2019, vol. 12, pp. 71- 83.

[309] S. GIUBBONI, "*Diritto del lavoro europeo*", Cedam, 2017, p. 123.

[310] Furthermore, it should be noted that the recent EU Directive 2019/1152 on transparent and predictable working conditions in the European Union, recital 8, appears to reference the case law of the Court of Justice regarding the identification of the "worker" category. In particular, article 1 (para2), defining the purpose and scope of the Directive, provides that: "*This Directive establishes minimum rights applicable to all workers in the Union who have an employment contract or employment relationship as defined by the law, collective*

autonomous definition, independent of national laws. The Court has stressed that the legal characterisation of an employment relationship under national law cannot determine the classification of a "*worker*" under EU law[312].

From the case law cited in the Court's reference[313], it emerges that a worker is an individual who provides, for a certain period, real and effective work under the direction of another party and receives remuneration for that work[314].

Consequently, three core elements underpin the EU notion of a worker: subordination (being under the direction of another), remuneration for the work performed, and the real and effective nature of the activity undertaken[315].

At the outset, subordination is frequently regarded as the defining criterion that characterises an employment relationship as dependent, although providing a precise definition proves challenging. Some commentators associate it with the organisation of work by another party[316], whereas others conceive it as the integration of the worker within the enterprise's organisational structure, even in the absence of direct supervision[317].

With regard to the remaining two elements, namely, the economic significance of the work and its actual performance, it should be emphasised that these serve to distinguish activities that carry genuine economic weight within the internal market, as opposed to marginal or ancillary undertakings[318]. Notably, the European conception of a "*worker*" eschews intermediate categories between employees and the self-employed, in contrast with certain other legal traditions[319].

In sum, EU case-law has elaborated a broad and inclusive definition of "*worker*", encompassing a variety of employment forms and designed to ensure effective protection

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agreements, or practices in force in each Member State, taking into account the case law of the Court of Justice".

311 S. GIUBBONI, "*Per una voce sullo status di lavoratore subordinato*", *cit*., p. 210.

312 CJEU, 21 february 2018, C-518/15, *Matzak*, par. 29.

313 CJEU, 26 march 2015, C-316/13, *Fenoll*; CJEU, 21 febbraio 2018, C-518/15, *Matzak*.

314 Cfr. CJEU, 8 june 1999, C-337/97, *C.P.M. Meeusen*, par. 13.

315 M. ROCCELLA, T. TREU, "*Diritto del lavoro dell'Unione Europea*", Cedam, 2012, pp. 96 ss.

316 S. GIUBBONI, Per una voce sullo status di lavoratore subordinato, *op. cit*., p. 213.

317 R. COSIO, "*La nozione comunitaria di lavoratore*", 2018, in http://www.europeanrights.eu/public/commenti/BRONZINI9-Cosio_secondo_commento_2018-04-04_nozione_comunitaria_di_lavoratore.pdf.

318 CJEU, 19 july 2017, C-143/16, *Abercrombie & Fitch Italia Srl*, par. 19; CJEU, 14 october 2010, C-345/09, *van Delft e a.*, par. 89; 16 july 2009, C-208/07, *von Chamier-Glisczinski*; 20 november 2001, C-268/99, *Jany*; 23 march 1982, C-53/81, *Levin*, par. 17.

319 N. COUNTOURIUS, "*An Autonomous EU definition of 'Worker' - Pitfalls and Opportunities for the European Labour Movement*", in ETUC, 4 december 2015, p. 10, where, analysing the *Kunsten case* (CJEU 4 december 2014, C-413/13, *FNV Kunsten Informatie en Media*) on the false self-employment, it is affirmed "*[…]the Court is clearly not willing to contemplate the notion of 'quasi-subordination' as a genuine third category*".

within the European internal market, leaving no scope for "*grey areas*" between subordination and autonomy[320].

Nevertheless, when endeavouring to apply the characteristics of this definition to the facts of the case at hand, the Court appears to have encountered certain interpretative difficulties[321]. Foremost among these is the fact that the courier may delegate the performance of tasks to a substitute, reflecting the impersonal nature of the service. Secondly, the freedom to determine whether to accept assignments and when to perform them reflects a lack of external direction, or the absence of direct managerial control.

The Court further observes that the courier may undertake work for other agencies, thereby negating exclusivity within the employment relationship.

Yet, it is apparent that the mere ability to choose if and when to work[322] is not, in itself, sufficient to confer "*worker*" status.

Scholars[323] have noted that, in EU case law, the freedom to choose working hours does not automatically negate the subordinate nature of an employment relationship, provided that other factors indicative of subordination are present.

This approach has been endorsed in cases such as *Allonby*[324] and *Abercrombie & Fitch Italia*[325], where the Court deemed it immaterial that workers were not obliged to accept every assignment for the purposes of classifying their employment relationship[326].

Consequently, the freedom to decide whether and when to work does not, per se, preclude the recognition of employee status, as it does not necessarily compromise the requirement of external direction. Furthermore, the courier's activity retains genuine economic significance, satisfying the remaining criteria for the EU definition of a worker.

Nevertheless, the possibility for the courier not to perform the work personally introduces a measure of complexity, both for the European notion of employment[327] and for national legal systems[328].

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[320] A. PERULLI, "*Il diritto del lavoro "oltre la subordinazione": le collaborazioni etero-organizzate e le tutele minime per i riders autonomi*", in WP CSDLE "Massimo D'Antona", 2020, 410.

[321] CJEU, 22 april 2020, C-692/19, *B. v Yodel Delivery Network Ltd*., par. 35: "*it follows from the specific features of the file submitted to the Court that a person, such as B., appears to have a great deal of latitude in relation to his putative employer*".

[322] CJEU, 22 april 2020, C-692/19, *Yodel Delivery Network Ltd*., parra. 40, 42.

[323] S. BORELLI, "*La prospettiva europea*", in A. Somma (a cura di), Lavoro alla spina, welfare à la carte, Meltemi, Milano, 2019, pp. 97-114, spec. pp. 101-106.

[324] CJEU, 13 january 2004, C-256/01.

[325] CJEU, 19 july 2017, C-143/16.

[326] S. BORELLI, "*La prospettiva europea*", *cit*., p. 106.

[327] A. PREULLI, "*Il diritto del lavoro "oltre la subordinazione": le collaborazioni etero-organizzate e le tutele minime per i riders autonomi*", *cit*., p. 43; citing *Lawrie-Blum*, that "*the EU notion of an employment relationship, as developed by the CJEU, refers to work performed by 'a person', with the effective and actual*

Methodologically, the Court adopted an approach privileging contractual formalities over factual realities. According to the judgment, it suffices that the courier possesses the option to choose when and whether to work, to delegate tasks, and to engage with other companies, for Directive 2003/88/EC not to apply, thus precluding classification as an employee[329].

The Court appears to have placed greater weight on the formal contractual framework than on the factual circumstances, without directly addressing the referring judge's query regarding the courier, who had never exercised the option to delegate nor worked for other firms. Nonetheless, the Court concluded that the courier's independence was genuine, and that no relationship of subordination existed[330].

Some commentators have observed that the Court gave insufficient consideration to the practical realities of work or the means by which employers might exert control over their workforce. For instance, substitution clauses are not always readily executable, given restrictions regarding the identity of substitutes and the procedural complexities involved[331].

It is evident, therefore, that the Court's decision diverges from prior rulings, which emphasised the need for an objective assessment of all circumstances[332].

In the current case, the Court appears to have focused almost exclusively on contractual formalities, largely disregarding the factual realities[333], despite citing precedents that underscored the importance of evaluating actual working conditions to determine the true nature of the employment relationship[334].

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performance of the work personally rendered being fundamentally relevant for the purposes of Article 45 TFEU".

[328] M. BARBIERI, "*Della subordinazione dei ciclofattorini*", in LLI, 2019, 2, pp. 1-61.

[329] See paras. 38 and 45 of the referred order: "*In that regard, concerning, first, the discretion of a person, such as B, to appoint subcontractors or substitutes to carry out the tasks at issue, it is common ground that the exercise of that discretion is subject only to the condition that the subcontractor or substitute concerned has basic skills and qualifications equivalent to the person with whom the putative employer has concluded a services agreement, such as the person at issue in the main proceedings*".

[330] See para. 45 of the referred order: "*the indipendence of that person does not appear to be fictitious and, second, it is not possible to estabilish the existence of a relationship of subordination between that person and his putative employer*".

[331] V. J. A. PRASSL et al., "*Eu Court of Justice's decision on employment status*", *cit*., p. 3.

[332] CJEU, 14 october 2010, *Union Syndicale Solidaires Isère*, par. 29; see also CJEU, 20 novembER 2018, *Sindicatul Familia Constanta*, para. 42.

[333] See para. 30, CJEU, 4 december 2014, C-413/13, *FNV Kunsten Informatie en Media* which in turn relies on a key precedent concerning false self-employment in the CJEU, 13 January 2004, C-256/01, *Allonby*.

[334] S. BORELLI, "*The Concept of Employee and Quality of Employment*", in S. Borelli, Pascale Vielle (eds.), Quality of Employment in Europe. Legal and Normative Perspectives, P.I.E., Brussels, 2012, pp. 119- 120. The Court references the Advocate General's conclusions in *Danosa* (2 September 2010, C-232/09, para. 66), according to which: "*Recognition of worker status cannot therefore depend on the classification given by the parties to the employment relationship or the conclusion of an employment contract. […] Moreover, the formal classification as self-employed under national law does not preclude a person from being considered a worker under Union law if their independence is merely fictitious*". The author also derives the same principle from ILO Recommendation No. 198/2006, para. 9, which provides that: "*For the purposes of national policy on the*

CHAPTER THREE

Labour classification issues of digital platforms across Italy, Spain and UK.

1. Introduction.

Following an examination of European legislation safeguarding the health and safety of workers engaged through digital platforms, platforms that deploy sophisticated algorithmic systems to manage employment relationships, thereby giving rise to a range of occupational health and safety concerns, which will be examined in due course, it is essential, in this chapter, to clarify the defining features of platform work, both in terms of its legal classification and the attendant protections afforded to such workers.

Work organised and managed via digital platforms represents one of the most recent and distinctive developments within the broader category of so-called "*non-standard form of work*"[335]. This occurs within a wider, two-decade-long process of labour fragmentation[336], encompassing all forms of employment characterised by transience, reduced working hours, and diminished social and economic protections relative to traditional full-time, permanent employment.

This form of work occupies the extreme end of the spectrum of organisational flexibility, wherein enterprises seek to manage labour in the manner and at the time most conducive to their objectives, often with minimal regulatory or contractual constraints.

Workers, by contrast, experience a highly precarious form of employment, with attendant risks to job stability, financial security, and health and safety protection.

Digital platforms wield a level of worker control and managerial influence markedly greater than that of traditional enterprises[337], facilitated by technologies such as the *Internet*, *Big Data*, and Artificial Intelligence[338]. These tools enable real-time monitoring of worker

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protection of workers in an employment relationship, the determination of the existence of […] an employment relationship should be guided primarily by the facts relating to the performance of work and the remuneration of the worker, notwithstanding how the relationship is characterised in any contrary arrangement, contractual or otherwise, that may have been agreed between the parties".

[335] F. BOGLIACINO et al., "*Quantity and quality of work in the platform economy*", in Zimmermann K.F. (ed.), Handbook of Labor, Human Resources and Population Economics, Berlin, Springer, 2019, pp.1-28.

[336] D. WEIL, "*The fissured workplace: why work became so bad for so many and what can be done to improve it*", Cambridge, Massachusetts, Harvard University Press, 2014.

[337] S. ZUBOFF, "*Surveillance Capitalism and the Challenge of Collective Action*", in NLF, 2019, 28, n.1, pp. 10-29.

[338] L. FANTI, D. GUARASCIO, M. MOGGI, "*The development of AI and its impact on business models, organization and work*", LEM Papers Serie n.25, Pisa, Sant'Anna School of Advanced Studies, 2020.

activity, assessment of performance against established standards, and the shaping of worker behaviour through incentives or sanctions[339].

As highlighted by certain scholars[340], this approach has been termed "*algorithmic management*" (to be analysed in greater depth in a subsequent chapter of this thesis).

Such practices may extend into traditional work settings, further enhancing employer control over employees and reinforcing hierarchical structures[341].

Moreover, the adoption of algorithmic management may drive greater fragmentation of production processes and an expansion of non-standard forms of work, with significant social consequences, including heightened labour disputes[342] and litigation initiated by platform workers seeking recognition of their rights and protections[343].

In any case, the characteristics of work mediated by digital platforms vary significantly from one country to another, depending on demand-side factors, such as urban density, and supply-side factors, including the degree of market regulation and the scope of social protection systems[344].

Against this backdrop, a particularly critical issue, demonstrating the extent to which digital platforms are progressively destabilising the certainties and protections traditionally associated with subordinate employment, concerns the legal classification of the relationship established between the actors engaged on digital platforms.

The digital platforms operate as computational infrastructures, combinations of *software* and *hardware*, which connect three principal parties: the platform operator, the service requester, and the service provider.

It is important to note that the relationship between the latter two parties is not physically governed by the platform operator but rather by an artificial intelligence system, whose degree of sophistication varies according to the service provided[345].

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[339] A. ALOISI, V. DE STEFANO, "*Il tuo capo è un algoritmo: contro il lavoro disumano*", Roma-Bari, Laterza, 2020.

[340] J. ADAMS-PRASSL, "*What if your boss was an algorithm? Economic Incentives, Legal Challenges, and the Rise of Artificial Intelligence at Work*", in CLLPJ, 2019, 41, n.1, pp. 123 ss.

[341] G. DOSI, M.E. VIRGILLITO, "*Whither the evolution of the contemporary social fabric? New technologies and old socio economic trends*", in ILR, 2019, 158, n.4, pp. 593-625.

[342] R.B. COLLIER, V.B. DUBAL, C. CARTER, "*Labor platforms and gig work: the failure to regulate*", in IRLE Working Paper, 2017, n.106, Berkeley CA, IRLE.

[343] A. DONINI, "*Secondo la Cassazione francese Uber è datore di lavoro*", in LLI, 2020, 6, n.1, pp. 1-15.

[344] D. GUARASCIO, (a cura di), "*Report sull'economia delle piattaforme digitali in Europa e in Italia*", Inapp Report n.7, 2018, Roma, Inapp. Moreover, a salient example pertains to the private road transport sector, where the global platform *Uber*, operating across numerous countries, has encountered barriers to entry in certain European markets due to stringent regulations restricting service provision exclusively to license holders authorised by local authorities.

[345] In this regard, reference should be made to article 47-*bis* of Legislative Decree No. 81 of 15 June 2015, as amended by Law No. 128 of 2 November 2019, which provides that, solely for the purpose of delivering goods

When such services involve the deployment of human labour, a system commonly referred to as the "*gig economy*" comes into play, an economy based on short-term, temporary work engagements.

The phenomenon of digitalisation, coupled with the rise of artificial intelligence as a central strategic component for numerous enterprises, has given rise to new professional profiles, fostered the development of previously unencountered skills, and generated a renewed focus on activities conducive to sustainable development and employment growth[346].

This context has facilitated the emergence and proliferation of the "gig economy," a term coined in 2015 by Hilary Clinton during a political debate: "*This on-demand, or so-called gig economy is creating exciting economies and unleashing innovation, but it's also raising hard questions about workplace protections and what a good job will look like in the future*"[347]. The expression encapsulates a novel economic system centred on the performance of ad hoc, temporary, or "*on-demand*"[348] work via digital platforms, utilised by companies such as Amazon, *Uber*, and *Deliveroo*. When the gig economy is evoked, the public imagination often conjures the image of a cycle courier, delivering food through a mobile application, as exemplified by *Foodora*.

However, the gig economy extends far beyond delivery riders, encompassing a heterogeneous array of digital workers. Examples include *TaskRabbit* service providers, engaged in domestic repairs, assembly and installation, removals, cleaning, and gardening; *Animaute* pet sitters; *Menuenextdoor* home chefs; and even *Bemyeye* workers, whose role involves verifying the availability of products on retail shelves and submitting photographic evidence to clients[349].

This economic model has raised numerous challenges, beginning with the need to distinguish between related yet distinct concepts, such as *crowdwork* and *on-demand work*, both primary forms of digital labour[350] encompassed within the *gig economy*, and the so-called *sharing economy*, termed the "*collaborative economy*" by the European Commission.

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on behalf of third parties within urban areas using bicycles or motor vehicles, "*digital platforms are considered to be the software programs and IT procedures employed by the client which, irrespective of the place of establishment, are instrumental to the delivery activities, setting the remuneration and determining the modalities of performance*" (para. 2).

[346] G. MIELI, "*Sharing Economy, Gig e On Demand Economy, Algocrazia: come cambiano i paradigmi del lavoro*", in "Semestrali ABI", volume 10, ottobre 2018, pp 94.

[347] R. VOZA, "*Nuove sfide per il welfare: il lavoro nella gig economy*", in RDSS, 4/2018, Il Mulino, pp 663 e ss.

[348] R. STAGLIANÒ, "*Lavoretti. Così la sharing economy ci rende tutti più poveri*", Giulio Einaudi editore, 2018.

[349] R. VOZA, "*Nuove sfide per il welfare: il lavoro nella gig economy*", *cit*., pp. 663 ss.

[350] R. VOZA, "*Il lavoro reso mediante piattaforme digitali tra qualificazione e regolazione*", in RGL, Quaderni, 2017, pp 760 ss.

In particular, while *crowdwork* focuses on the distribution of tasks performed via digital platforms, whereby the client (the so-called *crowdsourcer*) tends to outsource assignments to an indeterminate "crowd" of workers (the so-called *crowdworkers*) who can complete the tasks remotely, *work on-demand*, by contrast, entails activities that, although organised and coordinated online, are carried out physically, as in the case of passenger or goods transport, catering, removals, cleaning, personal assistance, and other similar services.

Nonetheless, what unites these two models is the facilitation of the meeting between supply and demand for labour, mediated by the digital platform, which typically establishes minimum standards for the services it provides, also taking into account client feedback[351].

The broader model of the sharing economy, however, differs significantly from the gig economy. Literally translated as the "*economy of sharing*," the term was coined by the Oxford Dictionary in 2015 and defined as "*an economic system in which goods and services are shared between private individuals, either free of charge or for payment, via the Internet. Thanks to the sharing economy, it is possible to rent out one's car, apartment, bicycle, or even Wi-Fi network when not in use*"[352].

Thus, activities within this system are characterised by the sharing of private goods: the digital platforms operating in this context enable users to share a good or service without performing any autonomous or subordinate work. A clear example is the French carpooling platform *BlaBlaCar*, founded in 2006, which connects drivers travelling in their own vehicles with passengers seeking and willing to pay for a journey along the same route.

The same function is performed by the California-based platform *Airbnb*, founded in 2008, which, although it does not own any properties itself, connects those offering accommodation with those seeking short-term rentals.

By contrast, drivers on the US platform *Uber*, founded in 2009 as "*UberCab*," provide on-demand passenger transport without the option of choosing whether to accept a third party; in this instance, the gig economy model applies, as previously noted. This model facilitates the meeting of service demand and on-demand labour provision, requiring specific skills or services, without necessitating the conclusion of permanent employment contracts, with all the attendant implications for workers' protections, including those relating to health and safety[353].

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[351] C. LAZZARI, "*Gig economy e tutela della salute e sicurezza sul lavoro*", in RDSS, 3/2018, Il Mulino pp. 457 e ss.

[352] E.DAGNINO, "*Uber law: prospettive giuslavoristiche sulla sharing/on-demand economy*", in DRI, 2016, pp. 138 ss.

[353] E. DAGNINO, "*Uber law: prospettive giuslavoristiche sulla sharing/on-demand economy*", *cit*., pp. 138 ss.

From a legal perspective, the principal difficulty lies in classifying the employment relationship established through platforms, as no predetermined schema governs the performance of the work. Such forms of labour are characterised by considerable freedom in managing working hours and combining them with other activities, yet also by a high degree of economic dependence on the platform. Traditional categories of self-employment and subordinate employment appear insufficient to provide an effective classification capable of determining the rights and obligations of the parties[354], particularly given the significant scale this phenomenon has attained in the service sector.

Scholars have therefore sought to identify criteria to begin legally qualifying the phenomenon, distinguishing between two main types of platform work: work conducted "on" the platforms (as in the case of *Uber*), where the platform acts as an intermediary between client and service provider, and work conducted "through" the platforms (such as *Amazon Mechanical Turk*), where the labour is entirely virtual and dematerialised.

In both cases, the worker receives a predetermined remuneration, from which a percentage is deducted for the platform operator[355].

This distinction highlights that, in some instances, the worker may become "invisible," having no physical interaction with the client, which complicates the application of traditional employment law rules[356].

To address this complexity, some legal scholars have proposed rethinking the notion of the employer in functional terms, focusing on the activities performed rather than on precise legal references, and have suggested that platform work might also fall within the concept of subordination, albeit in a form distinct from traditional employment relationships[357].

2. Reframing employment relationships in the platform economy: autonomy and subordination in Italy, Spain, and the United Kingdom.

2.1. Preliminary observations.

[354] V. PERULLI, "*Lavoro e tecnica al tempo di Uber*", in RGL, 2017, I, p. 204, where it was observed that such operators, not enjoying the protections afforded to employees, cannot benefit from the advantages that market independence might confer, thereby resulting in an accumulation of the disadvantages associated with both statuses.

[355] V. LASSANDARI, "*Il lavoro digitale e la tutela collettiva*", in Liber amicorum in onore di G, Santoro-Passarelli, Torino, 2018, Tomo II, p. 993.

[356] V. LUNARDON, "*Le reti d'impresa e la piattaforma digitale nella sharing economy*", in Liber amicorum, in onore di G. Santoro-Passarelli, Torino, 2018, Tomo II, p. 1008.

[357] V. AURIEMMA, "*Impresa, lavoro e subordinazione digitale al vaglio della giurisprudenza*", in RGL, 2017, I, p. 285.

As previously observed, work conducted through digital platforms (illustratively captured in Ken Loach's celebrated movie *Sorry We Missed You*[358]), frequently engenders unprecedented forms of exploitation. Such phenomena[359] manifest in novel modes of labour subordination characteristic of contemporary work, placing considerable strain upon those individuals endeavouring to secure recognition of their subordinate status and the attendant legal protections. One encounters, in this context, labour relations in a state of continuous transformation, assuming new forms that are often concealed behind technological mechanisms, such as algorithms[360], which cloak subordination beneath a veneer of apparent autonomy.

This state of affairs prompts a profound question: how can conditions of such manifest dependence remain so inadequately safeguarded?

Labour law, conceived to rectify imbalances of power between contracting parties[361], is thus brought to bear even in these contexts, where classical contractual subordination may be absent, yet asymmetries of authority and economic dependency persist in pronounced form.

The transformations engendered within productive organisation by emergent technologies, intricately linked with the modalities of work regulation, have necessitated a substantive rearticulation of the traditional concepts of autonomy and subordination. Such developments carry far-reaching implications for the application and scope of labour protections[362].

While the classical dichotomy of autonomy versus subordination has long served as a conceptual lodestar, it has historically excluded categories of workers who, although formally

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[358] In this movie, a story of exploitation is told, where, before it begins, we hear the voice of Richy, an aspiring freelance courier, who, during an interview with the owner of an important delivery company, feels enthusiastic about becoming his own entrepreneur, as he wants to take control of his own destiny, investing his resources (such as the van he will have to rent from the company itself) and working not "for" the company, but "with" it, convinced that this will give him freedom and independence. However, this is nothing more than an illusion, as in reality, Richy will find himself bound to extremely harsh working conditions, lacking bargaining power and subject to inhuman shifts that erode his private and family life. Even if the orders are not given by a boss, they still come from an electronic device that regulates his activities.

[359] EUROFOUND, "*Employment and working conditions of selected types of platform work*", 2018, in Employment and working conditions of selected types of platform work; T. TREU, "*Diritto del lavoro e transizione digitale: politiche europee e attori sindacali. La digitalizzazione del lavoro: proposte europee e piste di ricerca*", in DRI, I, 2022; M. WEISS, "*La platform economy e le principali sfide per il diritto del lavoro*", in DLRI, 2018, III, pp. 175 ss.

[360] D. STARK, I PAIS, "*Algortithmic management in the Platform Economy*", in Sociologica, 2020, n. 3, pp. 47 ss; P. DE PETRIS, "*La discriminazione algoritmica. Presupposti e rimedi*", in M. BIASI (a cura di), Diritto del lavoro e intelligenza artificiale, Giuffré, Milano, 2024, pp. 225 ss.

[361] ILO, "*Labour law: Its role, trends and potential*", 2006, n. 143-144, p. 1; R. SANTUCCI, "*L'effettività e l'efficacia del diritto del lavoro*", Torino, Giappichelli, p. 8; A. VISCOMI, "*L'adempimento dell'obbligazione di lavoro tra criteri lavoristici e principi civilistici*", in DLRI, 2010, pp. 595 ss; R. DEL PUNTA, "*Un diritto del lavoro 4.0*", in https://salus.adapt.it/wp-content/uploads/2020/07/DEL-PUNTA_un-diritto-per-il-lavoro-4.0_2018.pdf, 2020, p. 225.

[362] M.L. RODRIGUEZ FERNANDEZ; D. PEREZ DEL PRADO, "*El impacto de la economía 4.0 sobre las condiciones de trabajo y empleo*", Estudio de caso en dos empresas de base tecnológica en Cuadernos de Relaciones Laborales, 2018, 36, 2, pp. 355-372.

autonomous in the execution of their tasks, occupy positions of socio-economic vulnerability. This is particularly evident in the platform economy, wherein firms orchestrate the engagement of an indeterminate cohort of workers, who execute assigned tasks using their own tools and equipment[363]; bicycles, motor vehicles, and the like, solely, at the explicit behest of clients, constituting so-called *on-demand work*[364].

The organisation of such labour is contingent upon the use of self-owned smartphone applications, through which the platforms, self-identifying as *technology enterprises*, mediate the interface between supply and demand for services.

Yet, this innovation is not devoid of juridical complexity.

These enterprise models, distinguished by their capacity to coordinate the means of production through algorithms and other digital instruments, provoke salient legal questions[365], particularly with respect to the characterisation of the employment relationship between the platforms and the workers engaged therein.

It follows that the imperative for robust and rigorous protections extends beyond the formal notion of subordination, encompassing also those workers who, although nominally autonomous, perform their duties within a framework of material subordination and economic dependence[366]. Such conditions are emblematic of platform work, which, in the contemporary industrial landscape, constitutes a dominant organisational paradigm, wherein labour relations are increasingly characterised by a fusion of autonomy and precarity.

With the proliferation of digital technologies, and particularly algorithmic systems, the traditional coordinates of time, place, and action that once defined industrial labour have become increasingly fragmented, thereby rendering the distinction between subordination and autonomy progressively more nuanced[367].

Moreover, the employment contract itself, which historically served to impose obligations of obedience and fidelity upon the worker, has lost much of its economic utility within the context of digital platforms.

Algorithmic systems now enable a multiplicity of instantaneous transactions, reminiscent of *Coase's transaction cost theory*, which are often more efficient than the establishment of a

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[363] M. FINKIN, "*Beclouded work in historical perspective*", in CLLPJ, 2016, 37, 3, pp. 603–618.

[364] E. DAGNINO, "*Il lavoro nella on-demand economy: esigenze di tutela e prospettive regolatorie*", in LLI, 2015, vol. 1, n. 1, pp. 86-106.

[365] A. ALOISI, "*Il lavoro "a chiamata" e le piattaforme online della collaborative economy: nozioni e tipi legali in cerca di tutele*", in LLI, 2016, vol. 2, n. 2, p. 16.

[366] M. D'ANTONA, "*Limiti costituzionali alla disponibilità del tipo contrattuale nel diritto del lavoro*", in ADL, 1995, p. 62.

[367] M.G. GAROFALO, "*Nuova organizzazione di impresa e diritto del lavoro*", in Sociologia del diritto, 2011, n. 3, p. 124.

singular, overarching contract of subordinate employment, thereby obviating the associated costs of legal protection inherent in such arrangements.

In essence, algorithmic management transforms the employment contract: it is no longer employed to ensure that one party is subordinated to another, but rather to "potentially" integrate the performance of work within the platform's organisational structure.

This structure is governed by mechanisms that modulate worker behaviour through incentives and penalties, such as ranking systems and customer evaluations[368], which, as previously noted, may pose significant risks to the health and safety of workers.

Such an approach carries two principal consequences. On the one hand, it ensures the repetition and continuity of service provision; on the other, it aligns the work performed with the interests of the enterprise. In other words, the cooperation of workers, far from being secured through obligations of obedience and loyalty, is effectively "induced"[369]: through the use of automated systems, enterprises no longer require contractual enforcement to secure compliance, thereby rendering traditional mechanisms of subordination increasingly redundant[370].

These transformations have, however, narrowed the protective ambit of labour law, leaving a considerable number of workers outside the scope of legal safeguards. Although not formally subordinate, these individuals require protections analogous to those afforded to traditional employees. It is therefore evident that the platform economy, emblematic of the Fourth Industrial Revolution, has exerted a profound impact upon conventional labour law categories, blurring the traditional demarcation between autonomy and subordination. In light of this, there is an urgent need for regulatory intervention to govern these forms of work, preventing workers from being compelled to accept precarious conditions devoid of essential safeguards, including those relating to health and safety[371].

To that end, this study will undertake a comparative analysis, focusing in particular on the Italian, Spanish, and United Kingdom contexts, examining how analogous economic and organisational realities have elicited divergent legal responses.

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[368] A. DONINI, "*Alcune riflessioni sulla presunzione di subordinazione della Direttiva Piattaforme*", in LLI, 2022, v. 8, n. 1, p. R.29 - R.42.

[369] A. DONINI, "*Alcune riflessioni sulla presunzione di subordinazione della Direttiva Piattaforme*", *cit*., p. 37.

[370] M. NOVELLA, "*Impresa, in Lavoro digitale*", a cura di M. NOVELLA -P. TULLINI, Giappichelli, 2022, pp. 22 ss.

[371] M. BETTONI, "*Il lavoro su piattaforma nell'era della gig economy. Il confine tra autonomia e subordinazione*", pp. 13-14, in TESI.pdf

In so doing, it will illuminate the varying normative strategies and judicial pathways adopted to address emergent forms of economic dependence and the challenges presented by the digitalisation of labour.

2.2. The evolution of Italy's legal framework for platform workers: navigating autonomy, subordination, and enhanced protections.

The issue of classifying workers on digital platforms has also been addressed within the Italian legal framework, both jurisprudentially and legislatively.

At the outset, it is worth noting that the Constitution, through articles 1, 3, 4, and 35, does not restrict its protection to subordinate employment alone.

Rather, it safeguards work as a fundamental expression of human dignity[372], in all its forms[373].

The Constitution thereby mandates the protection of labour in every manifestation, aiming to remove economic vulnerability and social inequality, irrespective of the context in which they arise[374]. According to certain legal scholars, the protection of work in its various forms is not a mere relic of corporatist traditions.

Instead, it provides a forward-looking vision[375]; article 35, read together with the second paragraph of article 3, seeks to eliminate barriers and foster an equitable society, whereby work should not only secure a livelihood but also serve as a vehicle for active participation in the civil and political life of the nation[376].

Against this backdrop, the impact of the gig economy in Italy can be better understood through empirical data. A study published in 2018 by the *National Social Security Institute* (INPS) surveyed the working-age population, including inactive individuals and those not currently employed, aged between 18 and 64.

Respondents were asked whether, during the reference week, they had engaged in any form of work, whether in general or specifically within the gig economy.

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[372] G. AZZARITI, "*Contro il revisionismo costituzionale*", Roma-Bari, 2016, p. 100.

[373] M. MAZZIOTTI DI CELSO, "*Lavoro (diritto costituzionale)*", Enciclopedia del diritto. Milano, Giuffré, 1973, p. 340; R. SCOGNAMIGLIO, "*Il lavoro nella Costituzione italiana. Il lavoro nella giurisprudenza costituzionale*", Ricerca diretta da Renato Scognamiglio, Milano, Franco Angeli Editore, 1978, p. 13.

[374] U. ROMAGNOLI, "*Il diritto del secolo. E poi?*", in DLM, Napoli, Editoriale Scientifica, 1999, p. 233.

[375] U. ROMAGNOLI, "*I diritti sociali nella Costituzione*", in DLM, Napoli, Editoriale Scientifica, 2005, n. 3, p. 532.

[376] U. ROMAGNOLI, "*I diritti sociali nella Costituzione*", *cit*., p. 533; M.G. GAROFALO, "*Unità e pluralità del lavoro nel sistema costituzionale*", Scritti in onore di Edoardo Ghera, Cacucci, 2008, t. 1, p. 439.

The questionnaire further addressed whether such work represented a primary or secondary employment and sought to establish the legal classification of the labour relationship, distinguishing between subordinate, autonomous, or platform-based work.

Through this survey, INPS was able to estimate the number of workers engaged in gig economy activities. By combining those for whom it was either a primary or secondary employment, and including unemployed or inactive participants, the study estimated that gig workers constitute approximately 2.03% of the total workforce.

This figure was conservatively weighted, taking into account ISTAT data indicating that 78.2% of individuals aged 18–64 are internet users, a finding corroborated by a separate study conducted by the De Benedetti Foundation[377].

In absolute terms, the number of gig workers is estimated to range between 589.040 and 753.248 individuals.

It is noteworthy that the majority of gig economy participants engage in such work as a secondary occupation, often to supplement their monthly income, particularly during periods of economic difficulty. The "golden age" of digital platforms emerged after the 2008 financial crisis, when economically vulnerable workers accepted more flexible and less protected conditions. From the platforms' perspective, these models proved highly advantageous, leveraging an already established infrastructure, namely, *Internet*[378].

Furthermore, the proportion of individuals undertaking *gig work* as a second employment is highest among those aged 30 to 50.

Age-based polarisation is also evident: younger individuals, between 18 and 24, actively participate, whereas engagement among older cohorts, aged 50 to 64, coincides with higher unemployment rates.

These forms of work provide multiple functions within the contemporary labour market: they offer an additional source of income for those already employed, a means for younger individuals to fund their university studies, and a financial safety net for older workers who find themselves in periods of occupational stagnation, yet not eligible for social security benefits.

In the face of a rapidly evolving social landscape and the emergence of increasingly diversified organisational models shaped by technological innovation, the legislator has been

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[377] A. MAGNANI, "*Gig economy, dal far west all'ingorgo di leggi: perché è difficile regolarla senza ucciderla*", ne Il Sole 24 Ore, 2018; R. VOZA, "*Nuove sfide per il welfare: il lavoro nella gig economy*", *cit*., pp. 663 ss.

[378] A. MAGNANI, "*Gig economy, dal far west all'ingorgo di leggi: perché è difficile regolarla senza ucciderla*", *cit*., 2018; R. VOZA, "*Nuove sfide per il welfare: il lavoro nella gig economy*", *cit*., pp. 663 ss.

compelled to adapt. This adaptation has sought to establish socially consolidated rules, though often elusive when measured against traditional legal categories of autonomy and subordination.

In this regard, between the 1980s and 1990s, a notable debate emerged around the so-called *pony express* phenomenon. It aimed to develop regulatory models capable of extending the guarantees typically reserved for subordinate workers to individuals performing platform-based activities, regardless of their formal contractual classification.

The *pony express*[379], the precursors of today's delivery *riders*, were workers engaged in parcel delivery using their own motorbikes and equipment, coordinated through radio transmitters.

This debate revolved primarily around the notion of freedom to accept or decline work calls, and its compatibility with article 2094 of the Civil Code[380].

A number of lower court rulings dismissed the significance of such freedom, affirming instead the existence of subordination. These decisions emphasised the socio-economic dependency of the workers, a dependency that transcends the technical or functional parameters of the work performed and reflects, rather, the workers' lack of production means and consequent integration within another's organisation[381].

Moreover, the worker's apparent freedom was deemed largely nominal, as their activities were necessarily absorbed within a business structure directed by others, of which they formed the "indispensable operational arm"[382].

Such a view, however, was not endorsed by the *Court of Cassation*[383].

The Court highlighted the incompatibility between the freedom of performance and the recognition of subordination, thereby adopting a more formalistic reading of the requirement of juridical continuity within the employment relationship[384].

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[379] P. ICHINO, "*Subordinazione, autonomia e protezione del lavoro nella gig economy*", in RIDL, 2018, pp. 294 ss.

[380] The provision, entitled *"Employee"*, reads as follows: "*An employee is any individual who undertakes, in exchange for remuneration, to collaborate within an enterprise by performing intellectual or manual work under the authority and direction of the employer*".

[381] C. CORDELLA, "*Il lavoro dei rider: fenomenologia, inquadramento giuridico e diritti sindacali*", 2021, 2, pp. 7-8, in 2021-2_Cordella.pdf.

[382] Pretura di Milano (*Milan Magistrate's Court*), 6 april 1987, in Orientamento della Giurisprudenza del Lavoro, 1987, p. 609.

[383] *Court of Cassation*, 10 July 1991, n. 7608, in Giustizia Civile, 1992, I, P. 108.

[384] See P. ICHINO, "*Libertà formale e libertà materiale del lavoratore nella qualificazione della prestazione come autonoma o subordinata*", in RIDL, 1986, p. 80.

Yet, this reasoning cannot easily be transposed to the legal classification of contemporary *riders*. The proliferation of digital technologies has introduced new and pervasive mechanisms of direction, organisation, and control, sometimes even disciplinary in nature.

Furthermore, the legal framework itself has evolved; both legislative and judicial developments have progressively broadened the scope of subordinate employment, blurring its boundaries[385] with autonomous work (art. 2222 of the Civil Code)[386].

Instruments such as *smart working* (as regulated under Legislative Decree No. 81/2017) and *hetero-organised collaborations* exemplify this tendency to merge characteristics traditionally belonging to distinct categories.

Indeed, as early as 2016, Italy displayed one of the highest rates of self-employment in Europe (approximately 21%). This category also encompassed workers who, while formally autonomous, remained economically dependent on a single employer, the so-called *quasi-subordinate* or *parasubordinate* workers, governed by special legislation. The concept of *parasubordination*, a product of Italian doctrinal elaboration, represents a particular form of autonomous work that nevertheless shares several traits with subordination[387].

From a legislative standpoint, this figure reflects the category of *coordinated and continuous collaborations* (known as *co.co.co.*)[388], introduced by Law No. 533 of 1973. By amending article 409(3) of the Civil Procedure Code, this law extended the labour procedural regime to agency and commercial representation contracts, as well as to "*other forms of continuous and coordinated collaboration, predominantly personal, even if not subordinate*."

Such a provision did not establish a new contractual type but rather identified a mode of performance common to different relationships, thereby delineating the area of *parasubordinate* work[389]. This category is characterised by three essential elements: continuity of service, referring to duration and stability over time[390], distinguishing it from the *contract for services* under article 2222 of the Civil Code, coordination, signifying functional integration between the collaborator's activity and that of the principal, without implying

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[385] O. RAZZOLINI, "*La subordinazione ritrovata e la lunga marcia del lavoro autonomo*", in LLI, 2020, vol. 6, n. 2, p. 137.

[386] This article, entitled "*Contract for Work*", reads as follows:*"When a person undertakes, in return for remuneration, to perform a work or service, employing predominantly their own labour and without any subordination to the principal, the provisions of this chapter shall apply, unless the relationship is governed by specific rules under Book IV."*

[387] A.a.V.v., "*Il lavoro parasubordinato*", in Lavoro parasubordinato - Wikilabour.

[388] G. GHEZZI, "*I rapporti di diritto privato soggetti al nuovo rito del lavoro*", in RGL, 1974, I, p. 91.

[389] G. SANTORO PASSARELLI, "*Il lavoro "parasubordinato"*", Milano, 1979.

[390] According to case law, this requirement is satisfied when the performance is not occasional but endures over time, implying a sustained commitment by the worker towards the client (Court of Cassation, 19 april 2002, n. 5698, in Notiziario di Giurisprudenza del Lavoro, 2002, p. 620).

hierarchical or directive authority[391], and the predominantly personal character of the work, requiring that the essential part of the activity be performed personally, even if auxiliary assistance is permitted[392].

As for remuneration, article 2225 of the Civil Code applies, linking compensation to the result and the work necessary to achieve it, unlike article 36 of the Constitution, which pertains to subordinate employment.

In the 1990s, the extensive use of such collaborations, often as a means of circumventing the protections associated with subordinate employment, prompted the legislature to intervene. The *Biagi Reform* (Legislative Decree No. 276/2003) introduced the so-called *project-based contract* (*contratto a progetto*)[393], designed to delineate genuine self-employment and to expose *false self-employment* as de facto subordination.

Consequently, all *co.co.co.* relationships (save for specific exceptions) were required to be linked to a defined project; otherwise, they were to be reclassified as subordinate employment.

However, since the project-based contract was necessarily of fixed duration, the reform effectively eliminated the possibility of establishing open-ended autonomous collaborations. Moreover, the relevant legal framework, already the source of considerable interpretative and judicial uncertainty, was ultimately repealed by Legislative Decree No. 81 of 2015.

In an attempt to rationalise the system, the Decree marked the end of the *project-based contract model* (*contratto a progetto*) and reinstated the classical dichotomy between subordination and autonomy.

It was precisely in this context that the reform known as the *Jobs Act*, introduced by Delegated Law No. 183 of 2014 and subsequently implemented through Legislative Decree No. 81 of 2015, was enacted. In its initial formulation, the Italian legislator sought to simplify and rationalise the array of contractual forms by declaring its intention to "overcome" coordinated and continuous collaborations, including project-based ones. Within this perspective, the 2015 Decree introduced two key innovations.

First, it repealed the provisions governing project-based work (articles 61–69-bis of Legislative Decree No. 276/2003), which would remain applicable only to contracts already in force at the time of its entry into effect. Second, it extended the discipline of subordinate

[391] See, *Court of Cassation*, 6 may 2004, n. 8598, in Foro Italiano, voce Lavoro e previdenza (controversie), n. 44.

[392] See, *Court of Cassation*, 13 july 2001, n. 9547, in Foro Italiano, 2002, I, c. 466.

[393] S. BORELLI, "*Economia delle piattaforme e diritto sociale: Questioni chiave in prospettiva comparata*", Working Paper, 2019, 10, p. 67.

employment to collaborations that were exclusively personal, continuous, and organised by the principal, including with respect to time and place of work (article 2, paragraph 1).

Nevertheless, the reform did not entirely abolish coordinated and continuous collaborations as referred to in article 409(3) of the Code of Civil Procedure.

Their continued validity was expressly reaffirmed by article 52(2) of Legislative Decree No. 81/2015 and later by Law No. 81/2017. The latter, through Article 15(1)(a), amended article 409(3) to specify that "*the collaboration shall be deemed coordinated when, in accordance with the coordination methods agreed upon by the parties, the collaborator autonomously organises their own work activity*".

The 2015 legislation thus introduced a distinction between collaborations *organised* by the principal, subject to the rules of subordinate employment, and those merely *coordinated* (a distinction later emphasised by the 2017 Act), which remained within the domain of autonomous work and thus fully legitimate. Furthermore, the exhaustive exceptions listed in article 2 (para. 2) of the Decree continue to apply, notably in relation to specific categories such as professionals, members of administrative or supervisory bodies, and participants in commissions.

Accordingly, the *Jobs Act*, far from abolishing coordinated and continuous collaborations, merely redefined their boundaries. On one hand, it brought within the sphere of subordinate employment those relationships characterised by a high degree of hetero-organisation. On the other, it reaffirmed the freedom of private autonomy in structuring ongoing autonomous relationships of indefinite duration, even beyond the codified contractual types[394].

It follows that the extension of subordinate employment rules to "*collaborations organised by the principal*" under article 2 (para. 1) of Legislative Decree No. 81/2015, as later amended by Decree-Law No. 101/2019, turned into Law No. 128/2019, has generated substantial interpretative difficulties; the latter provision, by removing the reference[395] to the organisation of time and place of work, confines *hetero-direction* (*eterodirezione*) to the traditional domain of subordination[396], while identifying *hetero-organisation* (*etero-organizzazione*) as the decisive criterion for the application of the protective regime.

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[394] For a thorough analysis, see G. SANTORO PASSARELLI, "*I rapporti di collaborazione organizzati dal committente e le collaborazioni continuative e coordinate ex art. 409 n. 3 c.p.c.*", 2015, pp. 3-10, in 2015-2_SantoroPassarelli.pdf.

[395] T. TREU, "*Rimedi, tutele e fattispecie: riflessioni a partire dai lavori della Gig economy*", 2017, 3-4, p. 391, in TREU_Rimedi-tutele-e-fattispecie_2017.pdf

[396] M. LEONE, "*Autonomia/subordinazione: realtà parallele con punti di incontro*", in Questione Giustizia, 2019, 4, pag. 3.

A lively doctrinal debate has since emerged concerning the nature of this form of collaboration under article 2. Discussion has centred primarily on two interrelated issues: first, whether such collaborations can be subsumed within the broader concept of an employment relationship; and second, their relationship with the coordinated and continuous collaboration provided for under article 409(3) of the Code of Civil Procedure. As to the first issue, some commentators maintain that the ambiguity of the original formulation of article 2 leads to the conclusion that *hetero-organised collaborations* should be considered as subordinate.

This view emphasises the presence of classical indicators of subordination, such as personal and exclusive performance, continuity, and the organisation of work execution and control, including over time and place[397]. Others, by contrast, interpret the provision as establishing a presumption of subordination, whether absolute or relative[398].

Scholars have also debated whether article 2 should be understood as a *norm of discipline* rather than one of legal definition (the so-called *norma di fattispecie*).

According to the former interpretation, the rule does not alter the formal legal qualification of the relationship as autonomous, even though the work is organized by the client[399]. Instead, it merely extends the substantive protections of subordinate employment to those autonomous workers who, owing to economic or organisational weakness[400], stand in a position of functional contiguity with dependent labour[401].

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[397] O. MAZZOTTA, "*Lo strano caso delle "collaborazioni organizzate dal committente*", in Labor, 2016, 1, pp. 7-9; F. SANTONI, "*Risposta al quesito Il lavoro parasubordinato organizzato dal committente*", in Colloqui Giuridici sul Lavoro, 2015, p. 123. See Ferrante, ibidem, pp. 35-37. According to this view, "*it appears evident that hetero-organization is merely an expression of managerial authority, so that hetero-organized work is essentially the work described under Article 2094 of the Civil Code, supplemented by parasubordinate work, along with additional provisions regarding the timing and location of the work, which ultimately delineate a narrower scope than that defined in Article 2094 of the Civil Code*".

[398]Under the first interpretation, the criterion of hetero-organization allows one to surpass the traditional notion of hetero-direction through a functional concept of subordination, which enables "*greater attention to the creation of the organization*."See L. NOGLER, "*La subordinazione nel d.lgs. n. 81 del 2015: alla ricerca dell'"autorità del punto di vista giuridico*", in ADL, 2016, 1, p. 67. Conversely, A. Perulli, "*Le nuove frontiere del diritto del lavoro*", in RGL, 2016, I, pp. 14-15. Others argue that the presumption of subordination is relative, permitting evidence to the contrary in court, tempered by the derogatory regime established under the second paragraph of article 2 of Legislative Decree no. 81/2015, as well as its coexistence with article 409, no. 3, of the Civil Procedure Code, while also providing for "*the application of labor law protections to collaborative relationships organized by the employer, including with respect to work schedules and locations*", see M. TIRABOSCHI, "*Risposta al quesito Il lavoro parasubordinato organizzato dal committente*", in Colloqui Giuridici sul Lavoro, 2015, p. 133; see also Id., "*Il lavoro etero-organizzato*", in DRL, 2015, 4, 5., in RI, 2015, 4, pp. 978-987.

[399] M. PALLINI, "*Dalla eterodirezione alla eteroorganizzazione: una nuova nozione di subordinazione?*", in RGL, 2016, I, p. 75; A. OCCHINO, "*Autonomia e subordinazione nel d.lgs. n. 81/2015*", in VTDL, 2016, 2, pp. 203 ss, spec. pp. 211 e 240.

[400] A. PERULLI, "*Le collaborazioni organizzate dal committente*", in A. PERULLI, L. FIORILLO (a cura di), Tipologie contrattuali e disciplina delle mansioni. Decreto legislativo 15 giugno 2015, n. 81, Torino, 2015, p. 290.

[401] G. ZILIO GRANDI, M. SFERRAZZA, "*Le collaborazioni organizzate dal committente*", in ADL, 2016, 4/5, p. 765.

Conversely, the latter interpretation conceives article 2 as a *constitutive norm* (*norma di fattispecie*), effectively broadening the very notion of subordination and thereby exerting indirect influence on article 2094 of the Civil Code[402].

This latter reading has given rise to the concept of *mitigated subordination* (the so-called "*subordinazione attenuata*")[403], widely discussed in case law.

In such instances, especially where the work performed is of low professional content or, conversely, of high professional autonomy, courts have tended to focus less on the exercise of hierarchical authority and more on the worker's integration into the organisational structure, shifting the analytical lens from direction to inclusion[404].

According to a different and more recent strand of scholarship, article 2 should be regarded as a form of *apparent norm (the so-called norma apparente)*[405], devoid of any genuine normative effect, since it does not introduce any truly innovative element compared to the traditional notion of subordination. On the contrary, it would merely confirm that the *hetero-organisation* referred to therein has always coincided with the external management already envisaged by article 2094 of the Civil Code.

Subsequently, the amendment introduced by Law No. 128 of 2019, converting Decree-Law No. 101/2019, replaced the adverb "exclusively" with "*predominantly*", eliminated the words "*with reference to time and place of work*", and added a further provision stating that "*the rules of this paragraph also apply where the performance is organised through platforms, including digital ones*"[406].

The introduction of the notion of the *predominantly personal* nature of the performance, thereby addressing the second interpretative issue, has effectively brought article 2 within the sphere of self-employment, confirming that *hetero-organisation* constitutes the decisive

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[402] See, for example, T. TREU, "*In tema di Jobs Act. Il riordino dei tipi contrattuali*", in DLRI, 2015, 146, 2, p. 164.

[403] V. NUZZO, "*Il lavoro personale coordinato e continuativo tra riforma e prospettive di tutela*", in WP C.S.D.L.E. "Massimo D'Antona".It, 2015, 280, 9; A. DONINI, "*Il lavoro su piattaforma digitale "prende forma" tra autonomia e subordinazione. Nuove regole per nuovi lavori?*", in DRI, 2016, 1, p. 173.

[404] See, for example, Court of Cassation, 8 april 2015, n. 7024, ne il Lavoro nella Giurisprudenza, 2015, 8-9, 814, accompanied by a note of C. SANTORO, *Eterorganizzazione e attività lavorative tipologicamente subordinate, relativamente ad un lavoro di pizzaiolo*; Court of Cassation, 28 march 2003, n. 4770, in Notiziario di Giurisprudenza del Lavoro, 2003, 550, concerning the employment of doctors in a private healthcare facility.

[405] P. TOSI, "*L'art. 2, comma 1, d.lgs. n. 81/2015: una norma apparente? 2, comma 1, d.lgs. n. 81/2015: una norma apparente?*", in ADL, 2016, 6, pp. 1120 ss.

[406] It appears well established that a performance carried out in a predominantly, rather than exclusively, personal manner cannot be reconciled with article 2094 of the Civil Code. Similarly, the removal of organizational control, even with regard to the spatial and temporal nature of the work, only serves to reinforce the notion of autonomy inherent in hetero-organized collaborations., see C. DE MARCO, A. GARILLI, "*L'enigma qualificatorio dei riders. Un incontro ravvicinato tra dottrina e giurisprudenza*", 2021, 1, p. 21, in 2021-1_DeMarco-Garilli.pdf.

element distinguishing such collaborations from those governed by article 409 of the Code of Civil Procedure.

In the latter case, the management of how the activity is integrated into the client's organisation remains within the prerogative of the collaborator, presupposing a consensual agreement between the parties concerning the expected outcome. In hetero-organised collaborations, by contrast, the client does not merely define the results to be achieved but also imposes operational parameters stemming from his or her own organisational structure, unilaterally determining the manner in which the activity must be performed[407].

Furthermore, article 1 of Law No. 128/2019, by introducing Chapter V-*bis* into Legislative Decree No. 81/2015, established specific *minimum protective provisions* in favour of self-employed workers engaged in the delivery of goods on behalf of third parties within urban areas, using bicycles or motor vehicles[408] through digital platforms[409]. Such legislation, however, does not extend to all workers performing services via digital platforms; nor is it confined solely to *riders* in the narrow sense, but also encompasses those[410] who carry out deliveries using other types of motorised vehicles[411].

More precisely, while paragraph 1 of article 47-*bis* restricts the application of such safeguards to self-employed workers delivering goods within urban areas by bicycle, thereby excluding those using motor vehicles, paragraph 2 defines digital platforms as programs or procedures used by the client to organise deliveries, determine remuneration, and establish the modalities of performance.

Nevertheless, significant inconsistencies have emerged between the minimum protections afforded to self-employed riders and article 2 (para. 1) of Legislative Decree No. 81/2015.

The distinction between those performing the same tasks under client-organised collaborations and those operating as self-employed workers has proven increasingly complex, due to the continuous nature of the former and the occasional nature of the latter[412].

In any event, it follows that where such workers cannot be deemed genuinely self-employed but are rather *hetero-organised*, or even *hetero-directed*, the applicable legal framework will be that of subordination, pursuant to article 2 (para. 1) of Legislative Decree No. 81/2015,

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[407] A. MARESCA, "*Brevi cenni sulle collaborazioni etero-organizzate*", in RIDL, 2020, I, pag. 80.

[408] Reference is made to the vehicles under article 47, paragraph 2, letter a, of the Highway Code, as established by Legislative Decree No. 285 of 30 April 1992.

[409] E. RAIMONDI, "*Il lavoro nelle piattaforme digitali e il problema della qualificazione della fattispecie*", in LLI, vol. 5, n. 2, 2019.

[410] M. LAI, L. RICCIARDI, "*Lavoro su piattaforma digitale e nuove tutele*", in Bollettino Adapt, 11 novembre 2019.

[411] See the list provided in Article 47, paragraph 2, letter a, of Legislative Decree No. 285/1992.

[412] V. CANGEMI, "*L'infortunio sul lavoro. Persona, tecnologie, tutele*", Bergamo, 2021, p. 101.

expressly preserved in the opening clause of article 47-*bis*[413]. The analysis of the normative framework must, moreover, be complemented by an examination of judicial developments concerning the legal classification of *riders*.

Both article 2 of Legislative Decree No. 81/2015 and the related interpretative debate have produced a relatively limited number of rulings, among which the well-known *Foodora* case and the decision of the Palermo Court stand out.

These judgments have preliminarily addressed article 2 of Legislative Decree No. 81/2015 in its original formulation, which, according to the legislator's intention, extended the application of subordinate employment law to "*collaborations consisting of exclusively personal and continuous work, where the manner of execution is organised by the client, including with regard to time and place of work*". As emphasised by the Court of Appeal in the *Foodora* case, such wording could still be construed as compatible with a form of autonomous work.

In *Foodora*, the Turin Court[414] rejected the classification of the relationship as subordinate employment, considering article 2 an *apparent norm*, whose scope of application, in the Court's view, was narrower than that of Article 2094 of the Civil Code[415]. The Court thus underscored the autonomy of the riders, highlighting their freedom to accept or decline specific delivery sessions according to their own personal needs. Indeed, there was no obligation to make themselves available[416] via the application used by the platform to allocate

[413] S. GIUBBONI, "*I riders e la legge*", in RDSS, 2019, 4, p. 849. This position was also confirmed by Circular No. 17 of 19 November 2020 issued by the Ministry of Labour, which considered the residual provision of article 2, emphasizing its occasional nature and the absence of the continuity required by article 2 to "complete *the framework of collaborations*" or to "*cover cases of collaborations organized by the employer*".

[414] *Court of Turin 7 may 2018*, in *Arg. Dir. Lav.*, 4-5, 2018, pp. 1220 ss. accompanied by a note of M. BIASI, "*Il Tribunale di Torino e la qualificazione dei riders di Foodora*". See also P. ICHINO, "*Subordinazione, autonomia e protezione del lavoro nella gig-economy*", in RIDL, 2018, II, pp. 294 ss; P. TULLINI, "*Prime riflessioni dopo la sentenza di Torino sul caso Foodora*", in LDE, 2018, 1, pp. 1 ss.

[415] R. DE LUCA TAMAJO, "*La sentenza della Corte d'Appello Torino sul caso Foodora. Ai confini tra autonomia e subordinazione*", in LDE, 1, 2019, pp. 7-8, It deems the solution offered by the Court of Turin acceptable, given the "*substantial overlap between the framework of Article 2094 of the Civil Code and that of hetero-organization*". Conversely, the opposite view holds , cfr. P. ICHINO, "*Subordinazione, autonomia e tutela del lavoro nella gig economy*", *op. cit*., 2018, p. 298; M. DEL CONTE, O. RAZZOLINI, "*La gig economy alla prova del giudice: la difficile reinterpretazione della fattispecie e degli indici denotativi*", in DLRI, 2018, 3, p. 677.

[416] The freedom to choose one's delivery shift, and thus to decide whether or not to make oneself available, was addressed in a recent ruling by the Italian Court of Cassation, which concluded that this constitutes an element "*external to the content of the employment relationship*" and therefore cannot, by itself, exclude the subordinate nature of the relationship (Court of Cassation, 13 February 2018, No. 3457), in the Database Dejure; M. NOVELLA, "*Il rider non è lavoratore subordinato*", in LLI, 2019, 5, pp. 1 ss.

shifts and deliveries; consequently, the platform could not exercise the typical powers of an employer, directive, organisational, supervisory[417], or disciplinary[418].

In contrast, the Court of Appeal of Turin[419] held that article 2 of Legislative Decree No. 81/2015 was applicable, construing this provision as a *tertium genus*, an intermediate category situated between subordinate employment (from which it departs owing to the absence of any obligation on the worker to perform) and *coordinated and continuous collaborations* (where performance is based on mutual agreement and autonomous execution). The Court thus interpreted *hetero-organisation* as a notion of *functional integration* within the client's productive structure[420], while emphasising the protective purpose of the provision and its capacity to accommodate the evolving forms of contemporary work relations[421].

In the same ruling, the Court acknowledged the technically autonomous nature of the employment relationship, while nonetheless extending to such workers the application of subordinate labour law provisions "*in respect of health and safety, direct remuneration, working time limits, paid leave and social security*".

This decision, however, was not immune from criticism, being deemed ambiguous by several commentators[422]. From the literal tenor of the law, it does not appear possible to infer a selective application of certain institutions to the exclusion of others; rather, the text seems to call for the *full application* of the protections afforded to subordinate employment.

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[417] P. TULLINI, "*Prime riflessioni*", *cit*., p. 6, it highlights how the Court's assessment of the actual methods of service execution and coordination is "somewhat apodictic," given the platform's involvement in *GPS* monitoring, issuing reminders in case of delays in order acceptance or delivery, and setting the hourly rate, factors that substantially limit the *rider*'s autonomy, leaving them free only to choose the route most convenient to them.

[418] P. TULLINI, "*Prime riflessioni*", *cit*,p. 7, it emphasizes that the sanctions imposed by *Foodora* should be regarded as atypical, yet they still carry a "punitive character" and reflect a legal power that is characteristic exclusively of an employment relationship.

[419] *Court of Appeal of Torino, 4 febbraio 2019*, in RIDL, 2019, II, pp. 350 ss. con nota di M. T. CARINCI, "Il *lavoro eterorganizzato si fa strada", op. cit*.; R. DE LUCA TAMAJO, "*La sentenza della Corte d'Appello Torino*", *op. cit*., pp.1 ss.; see also P. TULLINI, "*Le collaborazioni etero-organizzate dei riders: quali tutele applicabili*", in LDE, 2019, 1, pp. 1 ss.

[420] O. RAZZOLINI, "*La nozione di subordinazione alla prova delle nuove tecnologie*", in DRI, 2014, p. 994.

[421] The Court of Appeal of Turin revives an interpretation of Article 2 previously noted in a decision by the Tribunal of Milan dated 31 May 2018, as recorded in the DeJure database regarding the requalification of employment relationships. According to the Milanese court, the provision "*in extending the objective scope of application of the legal rules governing employment relationships to collaborations possessing the characteristics indicated by law, does not alter the legal nature of the relationships in question, which is, and remains, that of autonomous collaboration, albeit characterized by the personal, continuous, and hetero-organized nature of the performance*". More recently, albeit incidentally, the autonomous nature of the riders' performances has also been addressed by *Court of Florence, April 1th 2020* n. 886, in RIDL, 2020, II, p. 475, accompanied by a note of D. DRAETTA, "*Il lavoro autonomo dei riders ai tempi del Covid-19*".

[422] P. TULLINI, "*Le collaborazioni etero-organizzate*", *cit*., pag. 6-7.

The *Foodora* case reached its culmination with the judgment of the Court of Cassation No. 1663 of 2020[423], which revisited the interpretation of article 2 concerning *hetero-organised collaborations*. The Court of Cassation confirmed the applicability of article 2 (para. 1) of Legislative Decree No. 81/2015 to *riders*, but rejected the classification of such collaborations as a *tertium genus*. Instead, it endorsed the view, already delineated by the legislator, that the regime of subordinate employment should extend to such workers[424].

The Court thereby reaffirmed the corrective and anti-evasive rationale underpinning article 2, designed to prevent potential abuses in the use of collaboration contracts under article 409(3) of the Civil Procedure Code[425426].

Consistent with this approach, article 2 must be interpreted as a *regulatory norm*, whereby the legislator merely highlighted certain indicators, personal performance, continuity, and hetero-organisation, sufficient to justify the application of subordinate labour law[427] to collaborators functionally integrated into the client's enterprise. Such integration occurs *without* a consensual agreement on the modalities of coordination, unlike the case of *coordinated and continuous collaborations* under article 409.

It follows that the degree of autonomy recognised in the scenario described by Article 2 is confined to the *genetic phase* of the contract, namely, the worker's freedom to decide whether or not to undertake the engagement, but not to its *functional phase*.

In the latter, the manner in which the work is performed is unilaterally determined by the platform through the application installed on the worker's smartphone[428].

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[423] *Cass. 24 ottobre 2020, n. 1663*, in DRI, 1, 2020, pp. 145 ss. Rel. Ind., 1, 2020, pp. 145 ss. accompanied by a note of A. MARESCA, La disciplina del lavoro subordinato applicabile alle collaborazioni organizzate; M. BIASI, "*Le (in)attese ricadute di un approccio rimediale al lavoro tramite piattaforma digitale*", in Giurisprudenza Italiana, 2020, 7, p. 1809; M. BIASI, "*Tra fattispecie ed effetti: il "purposive approach" della Cassazione nel caso Foodora*", in LDE, 2020, 1, pp. 1 ss.

[424] *Cass. 24 ottobre 2020, n. 1663*, in DRI, 1, 2020, pp. 145 ss. Rel. Ind., 1, 2020, pp. 145 ss, point 32, where the judges highlight the substantial differences between hetero-organized collaborations and the coordinated and continuous collaborations under art. 409, no. 3, of the Code of Civil Procedure, the latter being characterized by coordination defined through a consensual agreement between the parties, whereas in the former the coordination is external. F. MARTELLONI, "*Le collaborazioni etero-organizzate al vaglio della Cassazione: un allargamento del raggio d'azione della tutela giuslavoristica*", in LDE, 2020, 1, pp. 7-10.

[425] Article 409, paragraph 1, number 3, as amended by article 15, paragraph 1, letter a) of Law No. 81 of 2017, states that: "*Collaboration is considered coordinated when, in compliance with the coordination methods established by mutual agreement of the parties, the collaborator autonomously organizes the work activity*".

[426] In legal scholarship, some have highlighted, both in the interpretation of the Court of Cassation and in its own words, a clear teleological/systematic approach, or, in English, a *purposive approach*, which would take into account the context in which article 2 of Legislative Decree No. 81/2015 was inserted and the protective purposes it was intended to guarantee, from which its anti-evasion function derives: M. BIASI, "*Tra fattispecie ed effetti: il "purposive approach della Cassazione nel caso Foodora*"", in LDE, 2018, pp. 1- 3.

[427] *Court of Cassation, 24 january 2020, n. 1663*, in DRI, 1, 2020, pp. 145 e ss., points 24-25.

[428] *Court of Cassation, 24 january 2020, n. 1663*, in DRI, 1, 2020, pp.145 ss, point 33.

Lastly, the Supreme Court rejected the selective approach adopted by the Court of Appeal, affirming that article 2 does not exclude the *full application* of the subordinate employment regime to hetero-organised collaborations. Nonetheless, a degree of ambiguity arises from the Court's acknowledgment that the comprehensive application of subordinate rules might be "ontologically incompatible" with certain situations falling outside the scope of article 2094 of the Civil Code[429].

Such reasoning potentially opens the door to a selective application of labour protections, excluding some norms strictly linked to subordination. Moreover, the risk of an *uncontrolled imperative subjectivism*[430] may emerge where judges are required to assess, case by case, the compatibility of subordinate institutions with the autonomous nature of the relationship, leading to uneven exclusions of protections, especially in areas not yet fully regulated, such as social security coverage.

A shift in perspective concerning the legal classification of riders occurred with the judgment of the *Palermo Court*[431], followed by the *Turin Court* (18 November 2021[432], confirmed on appeal in 2022[433]) and the *Milan Court* (Judgment No. 1018 of 20 April 2022[434], reaffirmed in October 2023[435]). Unlike the *Foodora* ruling of the Court of Cassation, these decisions classified riders as *subordinate employees*.

A similar conclusion was reached in the *Foodinho* case (operating under the *Glovo* brand), where the Court recognised subordination on the basis of a detailed analysis of the performance phase of the employment relationship, highlighting the constant algorithmic management exercised by the platform. The Palermo judge, in particular, criticised the approach of the *Turin Court* in *Foodora*, arguing that the *execution phase* should prevail over the genetic phase[436], given the concrete restrictions imposed by the platform on shift

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[429] In legal scholarship, some authors have reiterated the uncertainty of the outcomes associated with the judge's assessment: R. PESSI, "*Il tipo contrattuale: autonomia e subordinazione dopo il Jobs Act*", in O. Mazzotta (a cura di), Lavoro ed esigenze dell'impresa fra diritto sostanziale e processo dopo il Jobs Act, Torino, 2016, pp. 31-46.

[430] M. MAGNANI, "*Al di là dei cicli fattorini*", in LDE, 2020, 1, p. 7.

[431] *Court of Palermo, 24 november 2020*, in *Arg. Dir. Lav*., 2021, 1, pp. 105-125; F. CARINCI, "*Tribunale Palermo 24/11/2020. L'ultima parola sui rider: sono lavoratori subordinati*", in LDE, 2021, 1, pp. 1-12; A. PERULLI, "*Il rider di Glovo: tra subordinazione, etero-organizzazione, e libertà*", in ADL, 2021, 1, pp. 37-70.

[432] *Court of Turin 18.11.2021*, in Labor, 2022, pp. 213 ss. accompanied by anote of C. DE MARCO - A. GARILLI, "*La qualificazione del lavoro dei rider: ancora una volta il giudice accerta la subordinazione e individua nella piattaforma interponente il reale datore di lavoro*".

[433] *Cort of Appeal of Turin*, 13 settembre 2022, n. 974.

[434] A. BELLAVISTA, "*Riders e subordinazione: a proposito di una recente sentenza*", in LDE, 2022, n. 2, pp. 2-12.

[435] *Court of Milan*, 19 october 2023, n. 3237, in F. MARTELLONI, "*Collaborazioni etero-organizzate e libertà nel lavoro. Le implicazioni della distinzione tra fase genetica e fase esecutiva del rapporto in una recente pronuncia di merito*", in Giornale di Diritto del Lavoro e delle Relazioni Industriali, 2024, pp. 643 ss.

[436] *Court of Palermo, 24 novembre 2020*, in ADL, 2021, 1, pp. 105-125.

selection. The Court disputed the alleged freedom of riders to choose their shifts, as this choice was effectively conditioned by the "excellence score" algorithm assigned by the platform[437].

The Court, accordingly applied the traditional concept of *external direction* under article 2094 of the Civil Code, without reference to the notion of *hetero-organisation* in article 2 of Legislative Decree No. 81/2015 or to the subsequent provisions introduced by Chapter V-*bis*[438].

Furthermore, the ruling applied the National Collective Agreement for Commerce, Distribution and Services (*CCNL Terziario, Distribuzione e Servizi*), formally recognising the role of *delivery worker* and awarding the corresponding wage differentials. The disconnection of the courier's account was characterised as a *retaliatory dismissal*, the Court deeming plausible the punitive intent of the platform.

In conclusion, this judgment represents a pioneering attempt to qualify riders' relationships as subordinate employment, demonstrating the enduring adaptability of traditional labour law principles to new contractual paradigms, notwithstanding the pervasive role of algorithms and the transformation of work organisation in the digital age. For the sake of completeness, with regard to health and safety protection, it must be observed that the considerations made by the *Supreme Court*, particularly concerning the exclusion of the *tertium genus*, may also relate to the applicability, to the collaborations referred to in article 2 (para. 1) of Legislative Decree No. 81/2015, of the health and safety regime established by Legislative Decree No. 81/2008 in favour of employees[439].

This implies an implicit reconsideration of the scope of Legislative Decree No. 81/2008 with respect to quasi-subordinate collaborations, which applies both when the work is performed at the premises of the contracting entity (as provided for by article 3 (para. 7) of Legislative Decree No. 81/2008), and, more broadly, whenever the performance is hetero-organised within the meaning of article 2 (para.1) of Legislative Decree No. 81/2015.

Furthermore, as regards the health and safety protection of self-employed riders under article 47-*bis* discussed above, it should be noted that the aforementioned minimal framework, in

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[437] E. PUCCETTI, "*La subordinazione dei riders. Il canto del cigno del Tribunale di Palermo*", in LDE, 2021, 1, p. 12.

[438] M. BARBIERI, "*Il luminoso futuro di un concetto antico: la subordinazione nell'esemplare sentenza di Palermo sui riders*", in LLI, 2020, 2, pp. 79-80.

[439] See Article 47-*septies*, paragraph 3, of Legislative Decree No. 81/2015, as introduced by Decree-Law No. 101/2019, converted with amendments into Law No. 128/2019.

article 47-*septies*(3), provides both for compulsory insurance coverage against occupational accidents and diseases, and for the obligation of the contracting entity, using even digital platforms, to comply with the provisions of Legislative Decree No. 81/2008.

By stipulating that contracting entities shall ensure, at their own care and expense, compliance with the 2008 Decree also in respect of self-employed workers operating through digital platforms, this rule may be interpreted as a significant advancement in the extension of fundamental safety guarantees, regardless of the legal classification of the employment relationship. However, its brevity and ambiguity have raised interpretative concerns, particularly regarding the extent and scope of the obligations imposed upon the contracting entities.

The central question concerns the meaning to be attributed to the term *"compliance"* with Legislative Decree No. 81/2008: whether it entails full application of the decree's provisions to riders, a solution hardly compatible with their qualification as genuinely self-employed, or merely a partial reference to selected provisions. Yet even in the latter hypothesis, uncertainty persists as to which provisions are concretely applicable.

In this regard, article 21 of Legislative Decree No. 81/2008 assumes a pivotal interpretative role, as it seeks to regulate the position of self-employed workers by imposing minimum requirements, such as the proper use of work equipment and personal protective devices, and the possession of an identification card when operating under contracts or subcontracts, while granting them the option, at their own expense, to undergo specific training and medical surveillance.

Consequently, the protection afforded to self-employment under the decree appears substantially limited and marked by a voluntary character.

It is precisely within this framework that the provision introduced by article 47-*septies* can be construed as broadening the scope of protection, placing upon contracting entities the obligation to organise and finance training and medical surveillance, albeit only insofar as self-employed workers actually wish to avail themselves of such measures. Indeed, the expression *"at their own care and expense"* seems to refer not to the imposition of new obligations upon the workers, but rather to the transfer of the related organisational and financial burdens onto the contracting entities. This implies that the latter must ensure the effective availability of such measures even when their internal organisation lacks them (for instance, in the absence of employees or an occupational physician).

Conversely, an interpretation that converts the faculties recognised to self-employed workers into genuine obligations, equating them to those of employees, would be untenable, as it

would conflict both with the legal nature of self-employment and with fundamental principles of labour criminal law, particularly the principles of legality and the prohibition of analogy *in malam partem.*

Confirming this reading, article 47-*septies* does not affect the content of Article 60 of Legislative Decree No. 81/2008, which establishes sanctions applicable to self-employed workers[440]; any failure by them to comply with such provisions would therefore not be punishable.

Nevertheless, uncertainty remains concerning the sanctions applicable in the event of a breach of the obligations incumbent upon contracting entities.

Given that article 21 refers to articles 37 and 41 of Legislative Decree No. 81/2008, concerning, respectively, training and medical surveillance, and that the corresponding sanctions (article 55 (para. 5)(c)[441] and (e)[442]) explicitly refer to the *"employer"*, the issue arises whether such provisions may extend to contracting entities. Such an extension would be conceivable only if one were to acknowledge in them a position analogous to that of the *"employer for safety purposes"*, that is, the person responsible for the organisation within which the activity is performed.

Although this figure is not expressly mentioned in either Legislative Decree No. 81/2008 or article 47-*septies* of Legislative Decree No. 81/2015, a teleological interpretation of the rule may lead to the conclusion that the legislator intended to attribute to the contracting entity a similar preventive role. Yet such an approach must be carefully scrutinised in light of criminal law principles, so as to avoid interpretative distortions and conflicts with the principle of legality.

Ultimately, this legislative reform, while representing a commendable attempt to extend preventive protection to self-employed platform workers, is not devoid of ambiguity.

Although it introduces an obligation for contracting entities to provide and finance preventive measures, such as training and medical surveillance, upon request of the workers, it does not transform these faculties into binding duties for the latter.

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[440]Where, with regard to certain subjects including self-employed workers, paragraph 1 provides: a) imprisonment of up to one month or a fine ranging from €200 to €600 for violations of Article 21, paragraph 1, letters a and b (failure to use suitable equipment and personal protective devices); an administrative fine of €50 to €300 for each individual for violations of article 21, paragraph 1, letter c (failure to provide an identification card in the context of contracts: see also article 60, paragraph 2).

[441] which provides the alternative penalty of imprisonment from two to four months or a fine ranging from €1,200 to €5,200.

[442] which provides for a fine ranging from €2,000 to €4,000.

This calls for a tailored modulation of the protections under Legislative Decree No. 81/2008, taking due account of the distinctive features of digital self-employment, characterised by high mobility, the absence of a fixed workplace, and broad organisational discretion.

In this perspective, prevention should also encompass additional dimensions, such as the provision of information and risk assessment linked to the concrete conditions of work performance, from traffic and weather conditions to a careful evaluation of psychosocial risks associated with continuous digital interaction[443].

Continuing along the trajectory of protective measures for riders, it is also worth recalling Regional Law No. 4/2019 adopted by the Lazio Region, which established specific rights in favour of *digital workers.*

Essentially, this legislation obliges platforms to provide occupational health and safety training and personal protective equipment, as well as to arrange insurance against workplace accidents and other relevant coverage. It also prohibits piece-rate payment and enforces compliance with the minimum wage established by national collective agreements.

Digital workers must, moreover, be informed about working conditions and the operational logic of platform algorithms.

In the Piedmont region, a legislative proposal was introduced in 2018 and unanimously approved by the Regional Council on 22 January 2019. This law aims to expand the rights of such workers by ensuring transparency regarding working conditions, fair remuneration, the prohibition of piece-rate pay, the right of trade unions to negotiate algorithmic management, the right to disconnect, regulations on working hours, and protection against discrimination. Furthermore, the legislation seeks to broaden the legal definition of employment, classifying all individuals who receive instructions via an app or other *software* as employees[444].

More recently, another significant regulatory intervention concerning the protection of riders is represented by Legislative Decree No. 104/2022, enacted to implement European Directive 2019/1152 on transparent and predictable working conditions across the European Union.

The decree applies to all workers entering into employment relationships with employers established in Italy, regardless of the form, duration, or sector of the engagement.

The Decree seeks to guarantee certain minimum rights and principles, including the right to receive written information regarding the essential terms of the employment relationship within seven days of commencing work, the right to request modification of the employment

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[443] For a complete analysis, see PAOLO PASCUCCI, "*Note sul futuro del lavoro salubre e sicuro… e sulle norme sulla sicurezza di rider & co.***", in DSL, 2019, 1, pp. 9-15.

[444] S. BORELLI, "*Economia delle piattaforme e diritto sociale: Questioni chiave in prospettiva comparata*", *cit*., p. 68.

form where the work is performed on a continuous and predictable basis, access to professional training and social protection, and the possibility to reconcile professional and private life through flexible working hours and the ability to refuse, limit, or receive compensation for tasks performed outside agreed working hours.
The Decree also establishes sanctions, which may entail a fine of €500 and imprisonment for up to two years, applicable to employers who fail to comply with its provisions[445].

2.3. Platform work regulation in Spain: from the presumption of subordination to safeguarding digital rights.

The Spanish legal system has been, especially from a legislative standpoint, the first EU Member State to adopt a more precise position on the issue of qualification.
At the outset, it should be noted that in recent years, starting as early as 2018, individuals performing activities through digital platforms as their primary source of income represented[446], according to the *COLLEEM II*[447] survey, only a small portion of the working-age Spanish population (2.6%), although Spain, after the Netherlands (2.7%), held the second-highest percentage of platform workers in Europe[448].
Despite these percentages, platform work has attracted growing attention in recent years, particularly concerning the legal status of this category of workers.
The Spanish authorities have been particularly active in identifying and denouncing abuses related to the employment conditions of such workers, while the Labour and Social Security Inspectorate, together with the *Social Security Office*, have been combating the phenomenon of "false self-employment" among platform workers[449][450].

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[445] D.lgs. 104/2022, in www.gazzettaufficiale.it.
[446] BRANCATI et al., "*New evidence on platform workers in Europe. Results from the second COLLEEM survey*", in JRC, Luxembourg, define main platform workers as those who provide labour services via platforms at least monthly, and work on platforms at least 20 hours a week or get at least 50% of their income through platforms.
[447] COLLEEM is developed by the *JRC and DG Employment*, *Social Affairs and Inclusion* to investigate the extent and impact of the digital labour platforms phenomenon in Europe.
[448] Digital platform workers in Spain tend to be young (21.5% of platform workers between 16 and 24 years, 25.7% between 25 and 34, 22.7% between 35 and 44, 17.7% between 45 and 54 and just 12.5% between 55 and 65) and male (32.5% of men have ever worked for digital platforms compared with 22.4% of women).
[449] In 2019 and 2020 alone, almost 30,000 workers from *Uber Eats*, *Glovo*, *Amazon* and *Deliveroo* were unilaterally re-classified as employees by the *Labour Inspectorate*. Nonetheless, interviewed representatives from the General Union of Workers (*Unión General de Trabajadores*, *UGT*) reported that many platform workers continue to work as self-employed, despite being recognised by the Labour Inspectorate as employees.
[450] The 2018 National Plan for Decent Work (*Plan Director por un Trabajo Digno*) sets bogus self-employment in the context of platform work as one of the key priorities.

That said, it can be highlighted that initially, there was no specific legislation governing platform work. In this regard, Spanish labor legislation still reflected the two traditional models of employment, subordinate (dependent) and self-employed, unconnected to each other and each governed by its own rules, although occupational safety regulations and some employment policies have only recently created common ground between the two models.

Moreover, subordinate employment, which forms the core of Spanish labor law, applies to all workers who provide services for remuneration on behalf of another party, within the organization and management of a natural or legal person referred to as the employer or entrepreneur, as established by article 1 of the Workers' Statute of 2015[451].

Self-employment rules, on the other hand, are less developed and define self-employed workers as those who carry out an economic activity on their own account without an employment contract.

In this context, it should be noted that, in the debate regarding the static or dynamic nature of the organizational model of business activity following the impact of digitalization, certain work performed by so-called "vulnerable" workers has been excluded from the scope of typical labor law protections, as occurred in the Spanish context, particularly with the 1994 reform of the Workers' Statute, which excluded transport workers using their own vehicles from legal protection[452].

However, a significant turning point appears to have occurred in 2007 with the creation of an intermediate category between employee and self-employed worker, where the worker, while maintaining legal independence, is economically dependent on a primary client. This refers precisely to the economically dependent self-employed worker (*TRADE*), whose regulation can be found in article 11 of the Law on the *Statute of Self-Employed Workers, (LETA or Ley del Estatuto del Trabajo Autónomo*)[453].

This type of self-employed worker, although not formally subordinate, finds themselves in a position of significant economic dependence on a single client. According to Article 11,

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[451] *REAL DECRETO LEGISLATIVO 2/2015, DE 23 DE OCTUBRE (EMPLEO Y SEGURIDAD SOCIAL), POR EL QUE SE APRUEBA EL TEXTO REFUNDIDO DE LA LEY DEL ESTATUTO DE LOS TRABAJADORES* (Última modificación: 30 de julio de 2025), in Boletin Oficial de Estado.

[452] M. RODRIGUEZ-PINERO, "*La huida del Derecho del Trabajo*", in Relaciones Laborales, 1992, 1, pp. 85-94, thus marking a departure from a judicial trend that has fuelled extensive debate on the so-called 'evasion' or 'flight' from labour law, as has been observed in respect of other occupational groups such as commercial agents and insurance representatives. In relation to the exclusion of transport operators, mention should be made of Constitutional Court Judgment 227/1998 of 26 November, which upheld the constitutionality of that exclusion, see B. SUAREZ CORUJO, "*La controvertida figura de los transportistas con vehículo propio y su exclusión del ordenamiento laboral*", in Revista Española de Derecho del Trabajo, 1999, 94, pp. 251-280.

[453] G.L. BARRIOS BAUDOR, M. APILLUELO MARTIN, "*Introducción al Estatuto del Trabajo Autónomo*", Thomson Aranzadi, Pamplona, 2007.

paragraph 1, of the reference law, these are individuals who habitually, personally, directly, and predominantly carry out an economic or professional activity for remuneration on behalf of a natural or legal person, referred to as the "client," from whom they receive at least 75% of their income derived from work or economic activities.

Such a threshold represents the objective criterion used to identify the economic dependency relationship and marks the dividing line between "pure" self-employment and more hybrid forms, closer to subordinate work.

In order for an individual to be classified as a *TRADE* worker, the law requires the simultaneous presence of a series of cumulative conditions, provided for in paragraph 2 of the aforementioned article 11, aimed at ensuring that the activity is indeed autonomous, albeit economically dependent.

First, according to letter (a) of paragraph 2, the *TRADE* worker must not employ other workers, nor may they outsource or subcontract the activity performed for the main client. However, such a prohibition includes a number of strict exceptions, allowing the hiring of a single employee in particular situations related to the protection of family and personal life, such as during pregnancy or breastfeeding, for birth, adoption, or foster care leave, as well as when the *TRADE* worker needs to care for children under the age of seven or for family members in a situation of dependency or disability.

In such exceptional cases, the self-employed worker assumes the status of an entrepreneur under the terms of article 1.2 of the Workers' Statute, with the provisions of subordinate employment applying to the extent compatible.

It should be clarified, in any case, that hiring must comply with strict limits: only one hire is permitted at a time, the duration of the contract is linked to the persistence of the cause that determined it, and the work performed cannot exceed 75% of the hours of a comparable full-time employee.

Moreover, a minimum period of twelve months must elapse between the end of one contract and the start of a new one, except in cases related to pregnancy or parental leave, for which the law provides an exception.

Another requirement concerns the need for the *TRADE*'s activity to be distinct from that of the client's employees: the worker must not perform tasks indiscriminately alongside the company's employees (art. 11, paragraph 2, letter b), so as to prevent the autonomous contract from being used to mask a true subordinate employment relationship. Furthermore, the *TRADE* must possess its own productive means and infrastructure (art. 11, paragraph 2, letter c), economically significant and independent from those of the client, and organize its activity

according to autonomous management criteria (art. 11, paragraph 2, letter d), while being able to receive technical guidance regarding the desired outcome (art. 11, paragraph 2, letter e).
Another defining element is the nature of the remuneration, which must be tied to the outcome of the activity, with the worker assuming the economic risk and reward.
The *TRADE*, therefore, is not entitled to any fixed salary as an employee would be, but rather to variable compensation based on productivity or the result of the assignment.
The law also establishes certain objective exclusions: *TRADEs* can never be owners of establishments, commercial premises, offices, or studios open to the public, nor professionals operating through a company or any other recognized legal entity. In such cases, the organizational and entrepreneurial dimension of the activity is such as to preclude any position of economic dependence comparable to that of *TRADEs*.
Finally, under Article 14 of the aforementioned *LETA*, a series of rights are guaranteed to *TRADEs* concerning working hours and rest periods, establishing minimum protections that may be enhanced through individual contracts or collective agreements of professional interest. In particular, the *TRADE* is entitled to an annual work interruption of 18 days, which may be extended by agreement between the parties or through collective arrangements; these agreements may also regulate weekly rest, public holidays, maximum working hours, and the distribution of work if calculated on a monthly or annual basis.
Any activity performed beyond the contractually agreed time must always be voluntary and may, in any case, not exceed 30% of regular hours, unless otherwise specified by professional agreements.
Moreover, the organization of working hours must be designed to promote the reconciliation of the worker's personal, family, and professional life.
A specific right is also recognized for self-employed female workers who are victims of gender- or sexual-based violence, allowing them to adjust their working hours to ensure their safety and access to integrated social support services[454].
It is clear that such a worker may be viewed both as an initial attempt to adapt the traditional model to include new professions, granting them, albeit partially, the protections of labor

[454] See art. 11 della Ley 20/2007, de 11 de julio, del *Estatuto del trabajo autónomo*. See also J. L. Monereo Pérez, B. del Mar López Insua, "*Las difusas fronteras entre el trabajo asalariado y por cuenta propia. Riders y plataformas digitales de nuevo a examen en la doctrina de los Tribunales Superiores de Justicia*", in Revista de Jurisprudencia Laboral, 2020, n. 4, pp. 6-8.

law[455], and, conversely, as a form of reduction of those protections which, due to the economic subordination that characterizes these new work figures, should be fully applied. It can also be seen as a way to "legalize" pseudo-self-employment without bringing any real improvement to working conditions[456].

Furthermore, it should be noted that both perspectives mentioned above have alternated in some commentaries on the aforementioned law, whose effectiveness was reduced by the 2009 financial crisis, which strongly affected the regulatory framework concerning employment relationships during the 2010-2012 austerity period.

Moreover, given the "unsuccessful" integration of this new work category within the sphere of self-employment[457], the introduction in Spanish law of a new category that broke the traditional dualism between subordinate and autonomous work has had a profound impact on subsequent debates regarding the classification of new work realities born from digitalization. This phenomenon has emerged particularly in the transport sector, commonly referred to as the "*Uberization of the economy*", as well as in the provision of goods and services within the digital economy, the so-called *gig economy* discussed earlier, which has brought significant changes to the organization of businesses and labor[458].

On the one hand, this has led to the coining of the term "*digital neotaylorism*," which enables more sophisticated forms of coordination and the deterritorialization of production; on the other hand, it has prompted the perception of this new phenomenon as a vector of change requiring a rethink of the rules that have traditionally governed employment relationships.

Questions have therefore arisen as to whether, in light of the clear incompatibility of the classical regulatory model with these new realities arising from digitalization, the concept of "*worker*", as defined in article 1.1 of the Workers' Statute, can still serve as an adequate benchmark to address the needs of these new professional figures, products of the digital

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[455] A. ALVAREZ DEL CUVILLO, "*El régimen profesional del trabajador autónomo económicamente dependiente*", in Cruz Villalón, J. y Valdés Dal-Re, F. (Dirs), El Estatuto del Trabajo Autónomo, La Ley / Wolters Kluwer, Las Rozas, 2008, pp. 237- 290.

[456] M. ALARCON CARACUEL, "*Aspectos críticos del Estatuto del Trabajador Autónomo*", in Agustí Juliá, J. y Pumar Beltrán, N. (Coords), El trabajo por cuenta ajena y sus fronteras, Bomarzo, Albacete, 2009, pp. 109-129.

[457] It should be noted that in 2019 the Bank of Spain estimated that 12% of the self-employed workforce could be classified as *TRADE*, corresponding to some 400,000 professionals whose income depended on over 75% from a single client. By contrast, the National Institute of Statistics (INE) revised this figure downwards following a survey of the active population, identifying only 143,000 individuals. With regard to contracts in which this condition had been formally recognised and registered as such with the Public Employment Service, the number fell to merely 10,000 out of a total of 1,500,000 self-employed workers without employees under their supervision.

[458] F.J. TRILLO PARRAGA, "*Economía digitalizada y relaciones de trabajo*", in Revista de Derecho Social, 2016, 76, pp. 59-82.

context, and whether, above all, it must be modified in response to this "new autonomy"[459] deriving from the peculiarities of the digital economy.

In the Spanish legal system, the debate on adapting the traditional worker model to the new digital organization of enterprises has primarily focused on the thorny issue of the legal classification of riders, who operate in a triangular relationship among the platform, the goods provider, and the customer.

According to an initial ideological/conceptual approach, emphasis is placed on the so-called "invisibility" of the platform, which functions as the organizer of the production process, presenting itself merely as an intermediary between the service provider and the recipient, while the worker is considered legally autonomous or independent.

This approach, which clearly rejects the category of subordinate employment, shifts attention to the realm of individual entrepreneurship, describing the work performed as an autonomous activity, an expression of freedom and personal self-realization.

From this perspective, it has been observed[460] that the reference to entrepreneurship assumes a political and cultural paradigm through which contemporary employment can be categorized.

Following this approach, the relationship between the rider and the platform is qualified as commercial, with compensation based on each individual delivery, as well as significant flexibility in terms of choice of working days and hours and the use of personal means (such as a bicycle and a smartphone).

Moreover, the worker is formally responsible for registering with the *Special Regime for Self-Employed Workers* (*RETA*) and may benefit from incentives for self-employment, such as the "flat-rate contribution" introduced in 2019 (approximately €60 per month)[461].

This vision has sparked a wide-ranging debate among Spanish labor law scholars, further fueled by comparisons with Italian and French legal systems and related case law

[459] A. PERULLI, "*Oltre la subordinazione. La nuova tendenza espansiva del Diritto del Lavoro*", Torino, Giappichelli, 2021.

[460] A. SERRANO PASCUAL, C.J. FERNANDEZ RODRIGUEZ, "*De la metáfora del mercado a la sinécdoque del emprendedor: la reconfiguración política del modelo referencial de trabajador*", in Cuadernos de Relaciones Laborales, 2018, 36, 2, pp. 207-224.

[461] There exists a programme known as "*New Entrepreneurs*", which, in line with the principle originally designed for individuals under 30 years of age and later extended to all age groups, currently provides such exemptions only for the first twelve months. Furthermore, there is also the possibility of reducing the contribution base for multiple activities within the *RETA*.

developments[462], and by the identification, analyzed previously, of the digital *TRADE*, a figure supported by platforms and defended in part by scholars who uphold its legitimacy[463].
However, beyond the doctrinal debate, which has focused on issues regarding the legal classification of the employment relationship, whether it falls within the realm of subordinate work or under the criterion of market independence, a decidedly significant role has been played in the judicial field[464].
In this latter context, the issue concerning the nature of the employment relationship with the platform has been highlighted along two lines: on the one hand, the claims for disconnection-related dismissals from the platform were emphasized, and on the other hand, the claims promoted by the labor authority in the so-called *ex officio* proceedings were underlined, where the Labor Inspectorate prompted the judiciary to rule on the existence of an employment relationship in order to sanction the platform company in cases of disguised self-employment.
In this regard, both individuals and the labor authority challenged the legal classification of the relationship as autonomous, even though these workers were economically dependent.
This was possible based on the presumption of the existence of an employment relationship between a person providing a service "*on behalf of and within the organization and management of another*" in exchange for remuneration (as provided by article 8.1 of the Workers' Statute), regardless of the *nomen juris* adopted by the parties.
It follows that, while for some, the dispute focused merely on the existence of a legal relationship (and thus, subordinate), enabling the recognition of unfair dismissal, for the Labor and Social Security Inspectorate, what mattered was highlighting the obligation of

[462] J. SERRANO GARCIA, S. BORELLI, "*El necesario reconocimiento de los derechos sindicales a los trabajadores de la economía digital*", in Revista de Derecho Social, 2017, 80, pp. 233-266.
[463]This is set out in a document prepared by the *Spanish Association of the Digital Economy* (*ADIGITAL*), an entrepreneurial association affiliated with the Board of Directors of the Spanish *Confederation of Business Organisations* (*CEOE*), which presented this proposal as a means to address "*a professional risk situation for companies arising from the potential ongoing existence of such employment relationships, either following individual claims before the Social Jurisdiction or as a result of actions by the Labour Inspectorate*". Moreover, for these companies, the work "*would not only modify the model, but would also exclude many workers who seek independence, freedom in the manner and timing of service provision, and a straightforward means of accessing income*". For this reason, and in pursuit of legal certainty, companies are proactively working to identify solutions that enhance their legal security and their relationship with platform users, hence the inclusion of the economically dependent self-employed worker (*TRADE*) and the establishment of professional interest agreements, such as the negotiation of comprehensive insurance policies with additional coverage for platform workers. See, in this regard, ADIGITAL, "*Propuesta normativa en materia de trabajo en plataformas digitales*", in Adigital, 2019.
[464] J. CRUZ VILLALON, "*El debate en torno a la adaptación o superación de la subordinación como elemento referencial del Derecho del Trabajo ante las nuevas formas de trabajo. Un debate global desde la perspectiva española*", in LLI, 6, 2, pp. 1 ss; W. SANGUINETI, "*El test de laboralidad y la dialéctica de los indicios de subordinación y autonomía*", in Revista de Derecho Social, 2022, 97, pp. 15-39.

registration and contribution to the general social security scheme for these workers, entailing the payment of the corresponding social contributions.

Following this debate[465] and continuing the case law thread, it should be noted that case law has expanded the scope of dependence in relation to situations where workers are subject, even flexibly, to the organizational and managerial sphere of the company.

In the Spanish context, the current debate concerning the legal classification of platform-based delivery riders, in many respects, revives the question of employment status that had already arisen in the 1980s in relation to traditional couriers. A decisive turning point was marked by the judgment of the Supreme Court of 26 February 1986 (RJ 1986\834), commonly referred to as the "couriers' judgment"[466], which inaugurated a jurisprudential approach that would significantly influence the criteria for determining the existence of an employment relationship.

Until that time, ownership of the vehicle had been regarded as a decisive factor in excluding employee status, as it was considered indicative of the assumption of business risk and of organisational autonomy. In that decision, however, the Supreme Court relativised the significance attributed to the tools used in the performance of the work, particularly where their economic value and scale were limited, and instead emphasised the centrality of the personal activity carried out and the concrete modalities of the worker's integration within the undertaking's organisational structure[467].

From a factual perspective, the couriers used their own motorcycles and bore the related expenses (fuel, maintenance and similar costs); they were remunerated per journey, independently of the price charged by the undertaking to the client; they were liable for damage only in cases of negligence; and they displayed the company's branding on both their clothing and vehicles. Although the contract was formally characterised as a transport agreement, providing for the absence of exclusivity, the possibility of substitution, and the lack of a fixed working schedule, in practice the workers had never appointed substitutes and had worked for approximately 75 per cent of working days. Moreover, they were required to telephone the company daily in order to receive their assignments, facing penalties in the event of delay.

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[465] J. PEREZ REY, "*¿Son los "riders" trabajadores? Comentario a los primeros escarceos judiciales en torno a las identidades débiles de la economía "uberizada"*", in Actum social, 2018, 141, pp. 20-27.

[466] In this regard, see *STS de 26 octubre 1987 (RJ 1987\7192)*; A. Pedrajas Moreno, F. Valdés Dal-Re, "*La sentencia de los mensajeros. Contrato de trabajo y contrato de transporte: ¿un giro en la jurisprudencia?*", in Poder Judicial, 1986, 2.

[467] In this regard, see STS 4 noviembre 1993, RJ 1993\8543 y STS 5 noviembre de 1993, rcud 798/1992.

In assessing the defining features of a contract of employment, the Supreme Court identified the essential elements of "*ajenidad*" (work performed on another's behalf), subordination, and the personal nature of the service[468].

With regard to *ajenidad*, the Court observed that the workers did not assume the economic risks or benefits of the transport contract concluded between the company and its clients, nor did they participate in the determination of its price. Their remuneration did not depend upon the outcome of the business transaction, but accrued solely by virtue of performing the work. Any liability for damage arising from negligence did not amount to the assumption of entrepreneurial risk, but rather reflected the ordinary consequences of contractual non-performance under general principles of obligations law[469].

As to subordination, the Court considered that the requirement to obtain daily instructions, the obligation to carry out assignments without delay, and the visible integration of the workers within the company's organisational framework constituted clear indicators of dependency, irrespective of the absence of a strict working timetable. The intermittent nature of the service was likewise deemed non-decisive, as it could be explained by organisational arrangements designed to avoid classification as employment. Similarly, the theoretical possibility of undertaking work for other undertakings was not regarded as incompatible with employee status.

Finally, concerning the personal character of the service, the Court noted that the contractual clause permitting substitution had never been implemented in practice and appeared instead to be a purely formal device intended to obscure the true nature of the relationship.

In sum, the 1986 judgment marked a departure from a formalistic approach centred on ownership of work equipment and advanced a substantive test focused on the worker's effective integration within the employer's organisation. This analytical framework, given its

[468] To further examine the criteria developed by case law to distinguish between an employment contract and a transport contract, the Spanish Supreme Court (TS) focused particularly on the concept of *ajenidad* (working for another's benefit). In assessing this, the Court considered factors such as whether the carrier had any role in setting prices, the true nature of the remuneration received (whether it was wages or reflected an entrepreneurial profit motive), and who bore responsibility for the goods transported. As indicators of subordination (dependence), the Court also examined whether the company set working hours, determined the routes to be followed, and exercised similar forms of control. See F. Valdés Dal-Re, "*Los inciertos criterios de diferenciación jurisprudencial entre los contratos de trabajo y de transporte (I), (II), (III)*", in Relaciones Laborales, 1992, n. 20, 21, 22; J. L. Prado Laguna, "*Delimitación de los contratos de trabajo y de transporte tras la reforma laboral*", in A. Baylos Grau (coord.), La reforma laboral de 1994. 1996, Cuenca, Ediciones de la Universidad de Castilla-La Mancha.

[469] See, in this regard, STC 227/1998, de 26 noviembre.

structural parallels, retains clear contemporary relevance in the ongoing debate over the legal classification of labour performed through digital platforms[470].

In the 2018, about the judgment of the *Juzgado de lo Social of Barcelona*[471], it can be observed that the subordination of riders to the platform *Take Eat Easy* can be identified, as the work performed was fully integrated into the "*circulo organizativo, directivo y disciplinario del empresario*", where the employer unilaterally exercised the typical managerial powers (directional, control, and disciplinary), which were concealed by the algorithmic organization.

It is clear that, in this context, the platform in question, far from being a mere intermediary, issued precise instructions through the app's algorithm installed on the smartphone (for example, displaying the platform's logo during delivery, complying with punctuality and courtesy standards, adhering to the time slots in which the work could be performed, and connecting approximately half an hour before the start of the session after selecting the time slot suggested by the platform), under penalty of severe sanctions, such as account suspension[472].

These are therefore elements decidedly incompatible with the autonomous nature of the employment relationship, as they are instead considered indicators of dependence and the worker's lack of independence from the company managing this digital platform, in accordance with the notion of subordination described in article 1.1 of the *Estatuto de los Trabajadores*.

The *Court of Valencia* reached the same conclusion, affirming the existence of an employment relationship between the couriers and the *Deliveroo* platform, thereby giving precedence to the *economic reality* of the relationship over the merely formal intention expressed by the parties[473].

In particular, the Court identified several indicators of subordination: the personal nature of the work performed, the obligation to comply with the unilateral instructions issued by the platform, the pervasive nature of the control exercised (including through geo-location tools), and the worker's alienation from both the result of the work and the organisation of the performance.

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[470] E. COLAS NEILA, "*Prestación de servicios a través de plataformas digitales en la doctrina judicial española ¿Trabajadores por cuenta ajena o autónomos?*", in LLI, 2019, vol. 5, n. 1, pp. 20-23.

[471] *Juzgado de lo Social de Barcelona* de 29 mayo 2018, n. 11. In this regard, see, E. COLAS-NEILA, "*Prestacion a traves de plataformas digitales en la doctrina judicial espanola. Trabajadores por cuenta ajena o autonomos?*", in LLI, 2019, vol. 5, n. 1, pp. 20 ss.

[472] E. COLAS-NEILA, "*Prestación de servicios a través de plataformas digitales en la doctrina judicial española ¿Trabajadores por cuenta ajena o autónomos?*", *cit*., pp. 28 ss.

[473] *Juzgado de lo Social de Valencia, 1 giugno 2018*, n.244, in LLI, 2018, 4, 1, p. 61.

With regard to the worker's apparent freedom to determine when to provide the service, the Court noted that such autonomy was in fact limited, since availability had to conform to time slots unilaterally established by the platform.

The *Court of Madrid* initially took a different view, classifying a cyclist working for the *Glovo* platform as self-employed, on the basis of his freedom to decide *whether* (*an*) and *when* (*quando*) to perform the service[474].

However, this approach was later overturned in a subsequent decision by the same Court, which recognised the existence of an employment relationship between *Glovo* and its *riders*[475].

This orientation was further consolidated by other judgments[476], most notably that of the *Court of Gijón*[477], which underlined that working-time flexibility does not, in practice, serve as a mechanism to reconcile work and personal life[478], but rather as a tool enabling the platform to identify the most profitable time slots for its own operations.

In the same vein, another decision by the *Court of Madrid*[479] found that the number of workers engaged by *Glovo* was so high that the contractual clauses purporting to grant freedom in the determination of working hours had no meaningful effect on the company's actual organisation of work.

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[474] *Juzgado de lo Social de Madrid, 3 settembre 2018*, n. 284.

[475] *Juzgado de lo Social de Madrid, 11 february 2019*, n. 53. See A. TODOLÌ, "*Análisis a la Primera Sentencia que declara la laboralidad de Rider de Glovo (y declara nulo el despido)*", 13 february 2019. The judgment was upheld on appeal (*Tribunal Superior de Justicia de Madrid, Sala de lo Social, 19 september 2019*, n. 715), notwithstanding the dissenting opinion of Judge Faga, who observed that "*el glover existe porque existe Glovo y la inversa, Glovo no podría existir sin glovers*", arguing that the relationship between the platform and the cyclist should be characterised as one of subordination.

[476] In particolar, see E. COLAS-NEILA, "*Prestación de servicios a través de plataformas digitales en la doctrina judicial española. ¿Trabajadores por cuenta ajena o autónomos?*", in LLI, 2019, 5, 1, p. 45, here were seven first-instance rulings, to which one second-instance judgment and one decision of the *Tribunal Supremo* were added, all recognising the *relación laboral* (employment relationship), and five first-instance rulings, supplemented by one second-instance decision, which instead classified the riders as *trabajadores autónomos económicamente dependientes* or *TRADE* (self-employed workers granted specific protections under Spanish law owing to their dependence on a single client). Among the judgments recognising this employment relationship as subordinate, one may also recall the *Juzgado de lo Social de Barcelona, 29 may 2018*, n. 213, against the platforms *TakeEatEasy* e *Factoo*, and *Juzgado de lo Social de Madrid, 3 april 2019*, nn. 128 e 129, against *Glovo*. Among the rulings that classify the *riders* as *TRADE*, all were against Glovo, however, *Juzgado de lo Social de Oviedo, 25 february 2019*, n. 106, *Juzgado de lo Social de Barcelona, 21 may 2019*, n. 202, e *Juzgado de lo Social de Barcelona, 29 may 2019*, n. 205.

[477] *Juzgado de lo Social de Gijón, 20 february 2019*, n. 61. The appeal lodged by Glovo was dismissed at second instance, by judgment *Tribunal Superior de Justicia Asturias, Sala de lo Social, 25 july 2019*, n. 01818. In this regard, see A. TODOLÌ-SIGNES, "*Análisis de la Primera Sentencia de un Tribunal Superior de Justicia que declara a un rider falso autónomo*", in Argumentos en Derecho Laboral, 2 august 2019.

[478] G. PACELLA, Il lavoro tramite piattaforma digitale nella giurisprudenza dei Paesi di civil law, *cit*., p. 25.

[479] *Juzgado de lo Social de Madrid, 4 april 2019*, n. 130. In this regard, see A. TODOLÌ, "*Nueva Sentencia que declara la laboralidad en Glovo. Aplica el Convenio Colectivo del Transporte categoría de Mozo*", 9 april 2019, in adriantodoli.com.

This line of reasoning was ultimately confirmed by the *Tribunal Supremo* in its landmark judgment of September 2020, which, similarly to the French *Cour de Cassation*, acknowledged the subordinate nature of the relationship between *riders* and digital platforms. The *Supreme Court* relied on the traditional indicators of subordination elaborated by Spanish case law, focusing in particular on the platform's interference with the way in which work was carried out, as well as on its exercise of managerial, supervisory, and disciplinary powers[480].

The Court attached particular importance to the element of *alienation*, both from the result of the work and from the productive organisation itself[481].

As regards the former, the worker's lack of entrepreneurial risk[482] (or, more precisely, of the risk–profit correlation typical of self-employment) was decisive: the platform unilaterally determined remuneration and managed all relationships with restaurants and customers[483].

As for alienation from the productive organisation, the Court observed that the worker's own means of production (a *mobile phone* and a vehicle) were not decisive for achieving the contractual purpose[484], unlike the algorithm and digital infrastructure, which were essential instruments fully controlled by the platform[485].

The worker's apparent freedom to decide *whether* to work was also found to be severely constrained by the platform's *rating system*, which in practice compelled riders to accept assignments during peak hours to avoid a reduction in their score, potentially resulting in exclusion from future tasks[486].

Ultimately, the *Tribunal Supremo* concluded that *Glovo* exercised the typical powers of an employer: issuing directives on how the work should be performed, monitoring riders through evaluation and geolocation systems, and imposing sanctions, including disconnection from the platform[487].

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[480] G. PACELLA, "*Il Tribunale Supremo spagnolo ci insegna qualcosa sul lavoro dei riders e anche sulla subordinazione del XXI secolo*", in LLI, 2020, 6, 2, p. 54.

[481] The link between subordination and the dual alienation of the worker with respect to both the outcome and the organisation has also been recognised in the Italian legal system by the Constitutional Court, which held that subordination is "*determined by the combination of two conditions that in other contexts never coincide: the alienation (in the sense of exclusive allocation to another) of the result for which the work performance is utilised, and the externality of the productive organisation in which the performance is embedded*" (Constitutional Court, 5 February 1996, No. 30).

[482] G. PACELLA, "*Il Tribunale Supremo spagnolo ci insegna qualcosa sul lavoro dei riders e anche sulla subordinazione del XXI secolo*", *cit.*, p. 33.

[483] *Tribunal Supremo Sala de lo Social, 25 september 2020*, n. 805, point 20.

[484] *Tribunal Supremo Sala de lo Social, 25 september 2020*, n. 805, point 12.

[485] *Tribunal Supremo Sala de lo Social, 25 september 2020*, n. 805, point 20.

[486] *Tribunal Supremo Sala de lo Social, 25 september 2020*, n. 805, point 18.

[487] *Tribunal Supremo Sala de lo Social, 25 september 2020*, n. 805, point 21.

In light of the foregoing, it becomes evident that the Supreme Court qualified riders as employees not "*because their work is mediated by an intrusive or sophisticated technology*", but rather "*because they do not organise their own work, are subject to the platform's unilateral determinations regarding how the activity is to be performed, and fall within its managerial, supervisory, and disciplinary powers*".

This ruling thus affirmed the adaptive capacity of labour law to respond to new organisational realities shaped by the digitalisation of production processes, while simultaneously signalling the decline of the so-called "*new autonomy*" theory associated with the *digital TRADE* figure, whose assumptions proved incompatible with relationships that, in substance, exhibit all the defining features of subordination to a subject that organises and directs the work activity in its entirety[488].

However, it must be noted that the judgment of the Spanish *Supreme Court*, although marking a major step forward in the legal classification of platform workers, also triggered a number of strategic responses by delivery platform companies.

These enterprises promptly modified the contractual terms concluded with couriers, with the apparent purpose of enabling them to initiate new legal proceedings under altered contractual frameworks, thereby seeking to obtain different judicial outcomes from those established by the *Supreme Court*.

In practice, this manoeuvre produced a kind of *reversal of the burden of proof* upon the riders, who were compelled to bring individual claims before the courts in order to obtain recognition of their employment status as subordinate workers.

Within this context, Spanish legislation came to be regarded as a testing ground for the emergence of new forms of employment contracts, revealing the growing need for an effective regulatory response through statutory intervention.

It should be recalled that, as early as 2015, there had been unsuccessful attempts to introduce measures aimed at improving the position of self-employed workers engaged in platform-based activities. These proposals were advanced within the framework of a joint governmental programme (which ultimately failed to materialise) between the *Socialist Party* (*PSOE*) and the centrist *Ciudadanos*.

In that joint programme, both parties had agreed on the necessity of "*identifying formulas for social security contributions applicable to part-time self-employment, as well as to occasional*

[488] F. FERRANDO GARCIA, "*Algunas reflexiones sobre la regulación del trabajo a través de plataformas digitales*", 2021, in https://www.net21.org/wp-content/uploads/2021/03/ALGUNAS-REFLEXIONES-SOBRE-LA-REGULACION-DEL-TRABAJO-A-TRAVES-DE-PLATAFORMAS-DIGITALES.pdf.

or economically complementary work, a phenomenon increasingly prevalent in the emerging "*collaborative economy*".

The debate surrounding platform work also reached the Spanish Parliament, where several legislative proposals and policy initiatives were introduced to address the labour market challenges posed by digital platforms.

In 2017 and 2018, a number of motions were presented raising concerns about the so-called collaborative economy, with particular reference to specific platforms such as *Deliveroo* and *Glovo*. In 2017, the left-wing parliamentary group *Unidos Podemos–En Comú Podem–En Marea* submitted a motion in the Senate urging the government to adopt measures for the supervision and control of companies operating in the digital or collaborative economy.

That motion harshly criticised what it described as a "*so-called collaborative economy*", focusing on *Deliveroo* and highlighting the negative implications of such practices for workers' rights.

Similar initiatives emerged at the regional level, with the left-wing nationalist party *Compromís* calling upon the national government to investigate the labour practices of companies active in the *on-demand* or *gig economy*, explicitly citing *Deliveroo* and *Glovo*. Subsequently, in February 2018, the *Congress of Deputies* adopted a motion requesting that the second *Rajoy government* clarify what measures it was considering to ensure decent working conditions within the digital economy.

This debate eventually led to the adoption, in December 2018, of the *Organic Law on the Protection of Personal Data and the Guarantee of Digital Rights*.

This law pursued a dual objective: on the one hand, it transposed into Spanish law the EU Regulation on the protection of individuals with regard to the processing of personal data and the free movement of such data; on the other, it was used by Parliament as a vehicle to introduce a new chapter on digital rights, including the right to digital disconnection and protection from excessive geolocation or video-surveillance practices.

Although representing a significant advancement in the construction of digital rights within Spanish law, this legislation did not specifically address the question of platform work[489]. The outbreak of the Covid-19 pandemic subsequently underscored the crucial role played by platform-based labour in the distribution of consumer goods.

In this context, renewed efforts were made to tackle the persistent issue of the proper legal classification of platform workers, and to establish an explicit obligation for delivery

[489]M. RODRIGUEZ-PINERO ROYO, "*Economia delle piattaforme e diritto sociale: Questioni chiave in prospettiva comparativa*", in ETUI, 2019, 10, pp. 94-96.

platforms, such as those operating in the food or parcel delivery sectors, to recognise platform-based workers as employees.

Against this backdrop, the *Rider Law* (*Royal Decree-Law 9/2021*, validated by the Congress in June 2021 and later enacted as *Law No. 12/2021*) was adopted as the outcome of negotiations between the Spanish Government (specifically, the Ministry of Labour and Social Economy), the main trade unions (*CCOO* and *UGT*), and the employers' associations (*CEOE*[490] and *CEPYME*[491]).

The law sought to introduce a *legal presumption of employment* for digital platform workers in the delivery sector (not limited to food delivery).

From a normative standpoint, the agreement took the form of a decree-law consisting of a single article divided into two sections, one concerning the classification of platform workers, and the other recognising their right to information, and was subsequently submitted to the standard legislative approval process.

In its first section, the legislative text introduces an amendment to article 1.1 of the *Statute of Workers* (*Estatuto de los Trabajadores*), enriching it through the addition of an *Additional Provision*, the twenty-third, which specifically addresses employment relationships within a particular sector, namely, that of "*remunerated services consisting in the distribution of any product or consumer good by employers who exercise the entrepreneurial powers of organisation, direction, and control directly, indirectly, or implicitly, through the algorithmic management of the service or of the working conditions, by means of a digital platform*"[492].

When viewed through a lens that strengthens the judicial interpretation of the concepts of *alienness* and *dependence*, this provision can be seen as a clear legislative point of reference for the bond uniting, in legal terms, the worker and the digital platform enterprise[493]. Indeed, this rule, drafted by the Ministry of Labour, effectively incorporates a precedent set by the Spanish Supreme Court, as previously examined, which, it should be recalled, classified the employment relationship between a *rider* and the *Glovo* platform as one of subordination.

Thus, through this legislative integration, the Spanish government has effectively presumed that the activities performed by individuals providing remunerated services consisting in the delivery or distribution of any product or consumer good fall within the scope of application of the *Statute of Workers*, whenever such services are rendered in favour of employers

[490] *Confederación Española de Organizaciones Empresariales*.
[491] *Confederación Española de la Pequeña y Mediana Empresa I*.
[492] See *Real Decreto-ley 9/2021, de 11 de mayo, por el que se modifica el texto refundido de la Ley del Estatuto de los Trabajadores, aprobado por el Real Decreto Legislativo 2/2015*, de 23 de octubre.
[493] F. J. TRILLO PARRAGA, "*La 'Ley Rider' o El arte de volver*", in Revista de Derecho Social, 2021, 94, pp. 19-38.

exercising the typical entrepreneurial powers of organisation, direction, and control, whether directly, indirectly, or implicitly, through the algorithmic management of the service or of the working conditions, by means of a digital platform.

This approach thereby relegates to the background the intermediate notion that had previously sought to classify such working arrangements under the legal figure of the *TRADE* (*trabajador autónomo económicamente dependiente*), as defined in article 11 of the *LETA*[494].

It becomes evident, therefore, that the legislative intent was not to create a new, intermediate contractual category between subordination and autonomy, but rather to subsume the concrete case that of the rider, within the general framework of dependent employment. Consequently, the burden of proving the absence of such dependency now rests upon the platforms themselves.

In the development of the aforementioned legislation, as underlined by the *Supreme Court*, the algorithm is regarded as capable, in a certain sense, of exercising forms of control, organisation, evaluation, and profiling over both the execution and the outcome of the work performance, thereby aligning the work carried out in different places and at different times with the pre-established corporate plan.

Of particular importance, in order to complete the picture, is also the second section of the sole article of the decree (which will be examined in greater detail below).

This provision, by amending article 64 of the *Statute of Workers* concerning the right to information, establishes an obligation for platforms to inform workers, including riders but also, more generally, all individuals performing services through platform work, as well as trade union representatives (the works council), regarding the algorithmic formula that affects the employment relationship, namely the working conditions, access to and maintenance of employment, including profiling mechanisms.

This measure will undoubtedly prevent the possibility of incurring sanctions relating to the evaluation of work performance, the criteria for which are currently interpreted unilaterally by the platform operators, or sanctions arising from participation in collective mobilisation or industrial action, as strike[495].

From the perspective of occupational health and safety, the *Instituto Nacional de Seguridad y Salud en el Trabajo* (INSST) has launched a public awareness campaign entitled "*Make Yourself Seen*", aimed at improving road safety among food delivery couriers using

[494] F. VALDES DAL-RE, "*El estatuto de trabajador autonomo en la legislacion espanola",* in Revista de derecho de la seguridad social, 2021, n. 3, pp. 29 ss.

[495] M. DE MINCIS, "*Così la Spagna risolve il rebus dei rider**", in Lavoce.info, 2021.

motorcycles and bicycles, given the high percentage of accidents occurring within this sector[496].

Moreover, as will be discussed in greater detail below, Spanish courts have dealt with numerous cases concerning platform work, particularly in the fields of delivery and private transport, where the central issue has revolved around the concept of "employee" (*trabajador*), as defined in the *Statute of Workers*, which sets out a series of criteria distinguishing dependent employment from self-employment.

The debate surrounding employment status has, furthermore, assumed a crucial role from the standpoint of occupational health and safety. In this regard, interviews conducted with the trade union *Unión General de Trabajadores* (UGT) and the riders' association *RidersXDerechos* revealed that the challenges related to health and safety in platform work can be addressed more effectively by focusing precisely on the legal status of the workers themselves. This approach finds explicit confirmation in article 4 of the *Statute of Workers*, which enshrines the fundamental rights of the worker, including the right to physical integrity and to an adequate policy for the prevention of occupational risks (art. 4.2, lett. d).

These rights are further specified in Law No. 31/1995 on the Prevention of Occupational Risks, which establishes minimum standards of health and safety for employees in Spain.

The primary responsibility lies with the employer, although collective agreements are allowed to define more detailed provisions or introduce more favourable conditions.

Conversely, it must be observed that self-employed workers do not fall within the scope of application of the aforementioned law, save for certain exceptions, for instance, in situations where several companies operate within the same workplace, in which case the duty to cooperate and to exchange information concerning health and safety also extends to the self-employed workers present in that environment. Furthermore, companies engaging self-employed workers are required to ensure compliance with occupational safety legislation. When such workers make use of machinery or equipment supplied by the company, the latter assumes the responsibilities set forth in article 41(1) of Law No. 31/1995, including the provision of adequate instructions[497].

2.4. Worker protection and regulatory approaches in the United Kingdom's gig economy.

[496] EU-OSHA, "*Spain: the "riders' law", new regulation on digital platform work*", in Eu-Osha, 2022, p. 1.

[497] This last exception may be especially relevant for platform workers when using machinery, equipment or tools that are provided by the platform (such as helmets, bikes and so on).

In Europe, one of the States most engaged in the development of the platform economy is the United Kingdom, where the 2008 financial market crisis exacerbated a phenomenon of precarisation and labour market deregulation that had been unfolding over several decades[498].

It should first be noted that this country, ahead of other European States, has witnessed the growth of the platform economy and enjoys a high degree of digitalisation within society, distinguishing itself with a markedly higher incidence of the phenomenon compared to the principal European economies.

According to a survey conducted by the *BEIS*[499] (*Department for Business, Energy and Industrial Strategy*), it is observed that digital platform work, considering both those who provide services via platforms as a primary source of income and those who operate on a secondary basis to supplement their earnings, accounts for approximately 3% of the workforce.

Specifically, the aforementioned survey, which in 2017 involved 11.825 respondents, revealed that platform workers in the United Kingdom tend to operate predominantly within private transport activities, such as those organised by Uber (18% of respondents). However, the income derived from such work is marginal relative to the respondent's overall earnings, with only 8% reporting platform work as their principal source of livelihood.

Overall, it may be affirmed that around 53% of respondents report satisfaction with their platform work, reflecting the degree of independence and flexibility characterising this form of employment. Nonetheless, as noted by several authors[500], it is important to consider the implications for occupational health and safety, given the elevated levels of anxiety recorded, arising from uncertainty and intense work rhythms, which were found to be higher than those experienced by other workers surveyed.

Furthermore, estimates from the *Chartered Institute of Personnel and Development*, conducted in March 2017, indicated that approximately 1.3 million individuals, representing 4% of all employed persons, were engaged in the *gig economy*[501].

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[498] M. FORTI, "*L'economia collaborativa davanti alla Corte di Giustizia dell'Unione Europea: alcune riflessioni a margine della sentenza Uber Spain*", in Rivista Italiana di Diritto Pubblico Comunitario, 2019, p. 515.

[499] K. LEPANJUURI, R. WISHART, P. CORNICK, "*The characteristics of those in the gig economy*", London, *Department for Business, Energy and Industrial Strategy* (*BEIS*), HM Government, 2018a; A. BROUGHTON et. al. "*The Experiences of Individuals in the Gig Economy*", London, Department for Business, Energy and Industrial Strategy (BEIS), HM Government, 2018.

[500] T. BERGER et al. "*Uber happy? Work and well-being in the gig-economy*", *Oxford Martin School Working Paper*, Oxford, Oxford Martin School, 2018.

[501] The *Chartered Institute of Personnel and Development* (*CIPD*) estimated that approximately 1.3 million people, representing 4% of all employed individuals, are engaged in the gig economy in the United Kingdom.

In light of this context, there arises a pressing need to resolve the long-standing issue concerning the legal classification of the employment relationship established between digital platforms and the workers operating therein.

In the English legal system, unlike in other legal systems[502], the legislature has not introduced any specific provisions to address the needs of those operating within the labour market, which is increasingly dominated by digital technologies; this implies that interpreters must adhere to the existing legal framework[503].

However, it should be noted that English law, in addition to the two traditional categories used to classify workers, namely employees and the self-employed, introduced, during the 1990s, a third category aimed at overcoming the rigid distinction between *employees* and *independent contractors*, known as the "*worker*".

This term essentially encompasses two figures: the fully-fledged employee and a somewhat analogous category, broadly referred to as a worker, which exhibits greater affinities with self-employment, yet benefits from certain statutory protections.

In order to fully appreciate the significance of the safeguards afforded to this latter category, it is important, at the outset, to highlight that the relevant legal framework centres on the so-called *contract of service*, which gives rise to an employment relationship and, consequently, the classification as an employee.

Against this backdrop, the protections afforded to employees allow a clear distinction to be drawn between work performed by those classified as *independent contractors*[504] under a *contract for services*, who are largely devoid of statutory safeguards apart from those concerning non-discrimination[505].

It should also be noted that the current regulation governing subordination is primarily found in the *Employment Rights Act* 1996, which defines an employee as an individual who performs work under a contract of employment, or contract of service.

However, this legislation is deficient in that it does not provide sufficiently precise criteria to distinguish subordinate from independent work; consequently, the courts have played a pivotal role in delineating the boundaries between these two categories.

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[502] J. DIRRINGER: "*Progetti e sviluppi normativi per la tutela del lavoro nelle piattaforme digitali in alcuni Paesi europei e nell'Unione Europea*", in RGL, 2017, 2, p. 147.

[503] E. MOSTACCI, A. SOMMA, "*Il caso Uber. La sharing economy nel confronto tra common law e civil law*", Egea, Milano, 2016, p. 80.

[504] V. PIETROGIOVANNI, "*L'importanza di chiamarsi lavoratori, ossia delle corti del Regno Unito alle (p)rese con il lavoro a chiamata attraverso le piattaforme*", in LLI, 2019, 5, 1, p. 46.

In this regard, the first and most significant criterion identified by the judiciary is the degree of control exercised by the employer.

The existence of the employer's authority to direct and supervise the worker's activities is, in fact, a quintessential element of subordination; this principle is also linked to the doctrine of *vicarious liability*, whereby the employer is held responsible for harm caused by the employee in the course of their duties.

The rationale for this doctrine lies in the employer's position of hierarchical superiority, which enables the implementation of preventive and supervisory measures within the employment relationship.

It is therefore evident that one of the central criteria for legally classifying a relationship as one of subordination is the exercise of control and managerial authority[506], which deprives workers of autonomy in the execution of their professional tasks[507].

A turning point in this field is to be found in the landmark case of *Ready Mixed Concrete* (1967)[508], in which the *High Court* articulated three fundamental conditions for recognising a contract of employment: the provision of remuneration in return for the work performed; subjection to the employer's control; and the absence of terms incompatible with a contract of employment.

Subsequently, case law introduced two further elements: the personal obligation to perform the work and the so-called *mutuality of obligation*, namely the reciprocal commitment of employer and worker to offer and carry out the work[509].

In addition to these primary requirements, the courts also identified secondary indicators, such as the degree of integration of the worker within the employer's organisation and the level of economic risk undertaken[510].

However, despite this interpretative evolution, English Courts have maintained a rather conservative approach[511], favouring adherence to the form and content of the written contract,

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[506] G. SMORTO, A. QUARTA, "*Diritto privato dei mercati digitali*", *Le Monnier*, Milano, 2021, p. 137; M. A. CHERRY, "*The Sharing Economy and the Edges of Contract Law: Comparing U.S. and U.K. Approaches*", in George Washington Law Review, 2017, p. 1815.

[507] See "*Performing Right Society Ltd. v Mitchell & Booker",* Ltd, 1 KB 762 (1924), and *"Mersey Docks and Harbour Board v Coggins and Griffiths (Liverpool)*", Ltd, A.C. 1, (1947), Ltd, A.C. 1, (1947).

[508] *Ready Mixed Concrete*, 1968, 2, QB 497, 515C.

[509]See, in this regard, *Nethermere (St Neots) Ltd v Gardiner* (1984), in ICR 612; *Cornwall County Council v Prater* (2006), in EWCA Civ., 102. This specific requirement concerns the mutual promise of the parties to maintain an employment relationship for a certain period of time, which must also be present "*an obligation on the employer to provide work and a correlative obligation on the employee to accept that work*". About this, see cfr. A. PERULLI,"*Il rider di Glovo: tra subordinazione, etero-organizzazione, e libertà*", in ADL, 2021, p. 60.

[510] See, *Hall (HM Inspector of Taxes) v Lorimer*, (1993), in EWCA Civ 25.

[511] G. DAVIDOV, "*Who is a worker?*", in IJLSS, 2005, p. 63.

that is, to the provisions agreed by the parties at the time of contracting regarding the legal classification of the employment relationship.

Such a formalistic approach has had significant consequences, as it has made the extension of employment protections to new categories of workers emerging in the context of technological and productive change less straightforward[512].

In this way, the English legal system has tended to exclude or marginalise many atypical workers, effectively depriving them of adequate protections in the face of contemporary labour market transformations[513].

To remedy this shortcoming, from the late 1980s and, more decisively, from the mid-1990s onwards, the legislature recognised the need to guarantee a minimum package of protections to workers irrespective of their formal classification as employees, thereby broadening the scope of protections originally reserved for traditional employees.

In this regard, it is appropriate to cite several legislative interventions which have played a crucial role in the celebrated case of *Uber v. Aslam*, such as the *Employment Rights Act 1996*, the *National Minimum Wage Regulations 1999*, and the *Working Time Regulations 1998*, which stipulate, in nearly identical terms, that the term *"... 'worker' ... means an individual who has entered into or works under ... (a) a contract of employment; [...] (b) any other contract, whether express or implied and (if express) oral or in writing, whereby the individual undertakes to do or perform personally any work or services for another party to the contract whose status is not, by virtue of the contract, that of a client or customer of any profession or business carried on by the individual*"[514] (Section 230(3)(b)).

From this definition, it is evident that the legislature sought to ensure a minimum package of protections, including paid leave, the national minimum wage, whistleblowing safeguards, health and safety protection, social security and tax contributions, and the right to form trade unions for collective bargaining, while reserving the full suite of traditional employment rights for employees proper (as defined under sub-section (a) above).

Moreover, to determine whether a worker may be considered entitled to the protections afforded to employees, it is first necessary to establish the presence of three elements: the existence of a contract under which the worker undertakes to perform work or services for another; the obligation to execute the work personally, and, crucially, that the party for whom

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[512] A. SUNDARARAJAN, "*The Sharing Economy: The End of Employment and the Rise of Crowd-Based Capitalism*", MIT Press, Cambridge, MA, 2016, p. 69.

[513] L. MASON, "*Locating Unity in the Fragmented Platform Economy: Labor Law and the Platform Economy in the United Kingdom*", in CLLPJ, 2020, p. 330.

[514] The literal text of *Section 230(3)(b*) is reported as follows.

the work is performed does not act as a client or customer in relation to any professional service carried out by the individual.

In this manner, as established by judicial authority[515], it becomes possible, even where the autonomous nature of the work is acknowledged, to effect a substantial extension of employment law protections, subject, it should be emphasised, to the actual existence of a discernible degree of subordination or economic dependence upon the client. Such an approach permits the recognition of the worker's economic vulnerability, analogous to that traditionally associated with an *employee*[516].

Fundamentally, in accordance with the reasoning articulated by the *Supreme Court* in *Bates van Winkelhof v Clyde & Co LLP*, the legislature did not seek to create an intermediate legal category straddling autonomy and subordination. Rather, its intention was to intervene within the domain of self-employment, identifying a subset of relationships characterised by specific defining features and a position of pronounced contractual weakness on the part of the worker[517].

More recently, English law has witnessed a seminal development in the interpretation of employment contracts, crystallised in the Supreme Court's decision in *Autoclenz Ltd v Belcher* of 27 July 2011[518]. This landmark ruling decisively departed from the traditional, conservative jurisprudence that had previously prevailed, which had adhered rigidly to a literal and formalistic construction of contractual terms.

Historically, two canonical rules of contractual interpretation were applied: the *plain meaning rule*, according to which judges were bound by the literal meaning of a contract where the language was clear and unambiguous[519]; and the *parol evidence rule*[520], which restricted

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[515] The definition provided by *Baroness Hale of Richmond* in *Bates van Winkelhof v Clyde & Co LLP* (2014) UKSC 32 states that: "*Labour law distinguishes between three types of persons: those employed under a contract of employment; self-employed individuals who operate on their own account and undertake work for their clients or principals; and an intermediate class of workers who are independent yet do not fall within the second category*".

[516] The leading case in this regard is *Byrne Brothers (Formwork) Ltd v Baird* (2002) *ICR* 667, in which it is observed (at para. 2(4)) that: "*The reason why employees are considered to require such protection is that they occupy a subordinate and dependent position in relation to their employers: the purpose of the Regulations is to extend protection to workers who are, in substance and in economic reality, in the same position*".

[517] For a complete analysis, see R. PETRUSO, "*L'economia di piattaforma e la qualificazione del lavoro digitale al vaglio della UK Supreme Court: il caso Uber v. Aslam* ", in Revista Actualidad Juridica Iberoamericana, 2022, 16, pp. 3717-3721.

[518] *Bates van Winkelhof v Clyde & Co LLP* , 2011, UKSC 41.

[519] G. H. TREITEL, "*The Law of Contract, Sweet & Maxwell*", London, 1995, p. 181; M. N. KNIFFIN, "*Interpretation of contract, Corbin on contracts*", in West Publish Company, 1998, p. 34.

[520] J. CHITTY, "*Chitty on Contracts*", Sweet & Maxwell, London, 2004, p. 753.

recourse to external evidence in circumstances where the contractual terms were manifestly precise[521].

Under this paradigm, external factors, such as the conduct of the parties or the contextual realities surrounding the contractual relationship, could not be taken into account where the text appeared clear (as to form)[522]. In *Autoclenz*, the *Supreme Court* repudiated the sufficiency of such formalistic criteria in the context of employment relationships marked by a significant imbalance of bargaining power between employer and worker.

The Court embraced a more realistic, substance-focused approach, recognising that the "*true agreement*" between the parties must be reconstructed in light of all relevant circumstances, encompassing the process of contract formation, the manner of performance, and, above all, the imbalance of power inherent in the relationship.

Consequently, the judge is enjoined to adopt a *purposive approach*[523], one oriented towards the protection of the weaker party; this entails that, where the circumstances so require, the judge may depart from the literal text of the contract and attribute a meaning that faithfully reflects the substantive reality of the arrangement, where the written terms fail to capture the actual content of the parties' agreement.

Subsequently, the issue of employment classification resurfaced before the English courts in 2016, with a leading case once again centred upon the *Uber* platform.

In this instance, a number of drivers brought proceedings seeking entitlement to the national minimum wage and paid annual leave, both of which were contingent upon recognition of their status as *workers*, or, in essence, employees, contrary to *Uber*'s position that they were merely *independent contractors*, given the company's self-characterisation as a digital infrastructure and intermediary between drivers and passengers.

The litigation unfolded through three tiers of adjudication: the decision of the *Employment Tribunal* in 2016[524], that of the *Employment Appeal Tribunal* in 2017[525], and, ultimately, the judgment of the *Court of Appeal (Civil Division)* in 2018[526].

Each of these decisions addressed the central question concerning the legal characterisation of the relationship between *Uber* and its drivers.

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[521] A. L. CORBIN, "*The Interpretation of Words and the Parol Evidence Rule*", Cornell L. Q., 1965, p. 161.
[522] LORD HOFFMANN, "*The Intolerable Wrestle with Words and Meanings*", in SALJ, 1997, p. 670.
[523] G. DAVIDOV, "*A purposive interpretation of the national minimum*", in MLR, 2009, p. 581.
[524] *Uber Bv v. Aslam*, (2016), in EW Misc B68 (ET); see also D. CABRELLI, "*Uber e il concetto giuridico di "Worker": la prospettiva britannica*", in DRI, 2017, p. 575.
[525] In this regard, see *Uber B.V. & Ors v Aslam & Ors*, UKEAT/0056/17/DA.
[526] *Uber BV v Aslam*, (2018), in EWCA Civ 2748.

Focusing on the initial decision, whose reasoning was later endorsed by both the *Employment Appeal Tribunal* and the *Court of Appeal*, it should be noted that one of the key preliminary issues concerned the legal nature of the *Uber* platform: whether *Uber* was to be regarded as a mere digital intermediary or, rather, the actual provider of the transport service.

The *Employment Tribunal* appeared to favour the latter interpretation, finding that *Uber* exercised a substantial degree of control over its drivers, selecting who could perform the service, fixing fares and routes, handling customer complaints, and reserving the power to disconnect drivers from the platform[527].

Consequently, the Tribunal recognised the drivers as "*workers*", that is, individuals personally performing services for a third party, thereby entitling them to protection under statutory provisions concerning the national minimum wage and paid annual leave[528].

The *Court of Appeal* upheld this reasoning, though not without a significant dissenting opinion. While the majority maintained that courts may legitimately depart from the written terms of a contract where these are designed to circumvent employment protections, *Underhill LJ* adopted a more formalistic and conservative stance, contending that *Uber*'s model represented merely a technological evolution of the traditional *minicab* service[529]. In his view, it was for the legislature, rather than the judiciary, to extend employment protections to such workers.

The Court's reasoning was, in essence, grounded upon *Uber*'s contractual practices.

Drawing upon the precedent set by the *Supreme Court* in *Autoclenz Ltd v Belcher*[530], it applied the principles governing *sham contracts* to employment relations such as that in question, wherein the employer unilaterally determines the contractual terms, leaving the worker no genuine choice but acceptance. The Court thus reaffirmed that the reality of the working relationship must prevail over its formal appearance, particularly where the written terms are contrived to misrepresent the true nature of the arrangement or to evade legal obligations.

This approach was subsequently endorsed[531] by both the *Employment Appeal Tribunal*, following *Uber*'s[532] appeal, and by the *Supreme Court*, which anchored its assessment of the

[527] In essence, the conclusion of this judgment is that Uber does not operate on behalf of the driver; rather, the opposite is true. This finding is consistent with the conclusion reached by the North Carolina District Court in *Douglas O'Connor v. Uber Technologies Inc.*, No. C-13-3826 EMC, 2015.

[528] *Employment Tribunal of London, 28 october 2016*, *Aslam e Farrar v. Uber*, in EW n. 2202551.

[529] A *minicab* is a private hire vehicle that can solicit passengers through an intermediary licensed as a private hire vehicle operator. See, for reference , E. MOSTACCI, E. SOMMA, "*Il caso Uber. La sharing economy nel confronto tra common law e civil law*", Egea, Milano, 2016, p. 104.

[530] *Supreme Court of the United Kingdom, 27 july 2011, Autoclenz Ltd. v. Belcher*, in UKSC, n. 41.

[531] *Employment Appeal Tribunal, 10 november 2017, Uber BV v. Aslam and others*, in UKEAT n. 0056/17/DA.

legal status of the relationship in the actual conduct of the parties, given the absence of a written contract between *Uber* and its drivers.

In particular, the *Supreme Court* rejected any notion that *Uber* functioned merely as an intermediary between drivers and passengers, observing that it was *Uber* which entered into contracts with passengers and engaged the drivers to perform the service.

Moreover, the Court identified several features incompatible with genuine self-employment: *Uber*'s unilateral determination of fares and working conditions, its influence over a driver's ability to accept trips, and its pervasive control mechanisms, including the driver rating system and the restrictions on direct communication between driver and passenger, designed to ensure *Uber*'s dominance over the service relationship[533].

The Court also sought to address the difficulties encountered by the *Court of Appeal* in appreciating the case law shift in contractual interpretation introduced by the aforementioned *Autoclenz* decision.

Against this backdrop, it became essential to depart once and for all, at least in the realm of employment relations, the traditional rule of contractual interpretation, the *plain meaning rule*, together with its evidentiary counterpart, the *parol evidence rule*.

This shift is of crucial importance within the context of the platform economy, in which digital intermediaries frequently present themselves as mere technological facilitators or agents in order to avoid recognising their collaborators as employees.

Consequently, if interpretation were bound by the legal characterisation chosen by the parties, it would be difficult to give due precedence to the factual reality over the contractual form, thereby preventing the law from addressing the structural vulnerability typical of such workers.

The *Supreme Court* thus brought to completion the interpretative path inaugurated by *Autoclenz*, providing a theoretical foundation for the principles established in 2011.

This rationale rests upon the necessity of ensuring the effective and non-derogable application of labour-protective norms; in its reasoning, the Court recalled the notion of *mischief*, a term drawn from the English interpretative tradition and rooted in the principle of equity. The interpretative approach known as the *mischief rule* requires that, for equitable purposes, ambiguous provisions must be construed so as to eliminate the very defect or inconvenience (the *mischief*) which the statute seeks to remedy.

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[532] *Court of Appeal of England and Wales (Civil Division), 19 december 2018, Uber BV v. Aslam and others*, in EWCA Civ., n. 2748.

[533] *Supreme Court of the United Kingdom, 19 february 2021, Uber BV and others against Aslam and others*, in UKSC, n. 5.

However, the English legal system allows for interpretation at several levels.

The *mischief rule*, in this respect, constitutes the final stage of an interpretative process[534] that begins with the *literal rule* (which adheres to the strict wording of the law), proceeds through the *golden rule* (which permits a logical and systematic reading), and culminates in the *mischief rule*, embodying a distinctively purposive approach[535]. Despite its exceptional nature, it has been persuasively argued that this rule should prevail whenever the effectiveness of protective labour norms is at stake.

Applied to the *Uber* case, these considerations mean that the judge, far from being constrained by the legal classification adopted by the parties, must assess the factual substance of the relationship. Once the primacy of the purposive interpretation has been recognised in statutory construction, it would be inconsistent to accord the *plain meaning rule* a dominant role in contractual interpretation when determining whether an individual should be regarded as an employee, a worker, or an independent contractor, for, as noted at paragraph 76 of the judgment, doing so would reproduce precisely the mischief which the legislation seeks to correct.

The protective rationale underpinning labour law requires that all those in a position of contractual weakness be afforded specific safeguards aimed at redressing the inherent imbalance of the employment relationship. From this perspective, the parties' agreement cannot even serve as "the starting point" for the classification of the drivers' activity, since such an approach would allow employers easily to evade legal protections by unilaterally drafting contractual terms defining the work of individuals entitled to protection[536].

Ultimately, the judgment represents a triumph of substance over form, of the concrete case over abstract regulation. The *Supreme Court* thus encountered no obstacle in classifying the relationship between *Uber* and its drivers within the category of *workers*.

This decision is highly significant, not only from a strictly labour law perspective, but also in its broader implications for the platform economy.

It illuminates how the business model employed by digital intermediaries such as *Uber*[537] utilises technology to facilitate interactions between private individuals who ostensibly

[534] It is therefore not a "global" interpretation, such as that to which a continental jurist is accustomed, but a "*scaled*" one : see, in this regard,, cfr. G. CRISCUOLI, M. SERIO, "*Nuova introduzione allo studio del diritto inglese*", Giuffré, Milano, 2016, pp. 370 ss.

[535] G. CRISCUOLI, M. SERIO, "*Nuova introduzione allo studio del diritto inglese*", *cit*., p. 372.

[536] *Supreme Court of the United Kingdom*, 19 February 2021, *Uber BV and others v Aslam and others*, in UKSC, No. 5, p. 76;

[537] A. BELLONI, "*Uberization. Il potere globale della disintermediazione*", Egea, Milano, 2017.

operate autonomously[538]. Yet, as the judgment makes clear, such economic models in the *sharing economy* are fundamentally predicated upon the artificial creation of informational barriers within the market, thereby producing imbalances of bargaining power among the participants within the digital communities that these intermediaries control[539].

The issue of data asymmetry (or information imbalance) between digital intermediaries and other actors within the sharing economy, particularly between these intermediaries and the workers engaged through such platforms, may well constitute the key to understanding how platform-based economic phenomena ought to be regulated, while at the same time clarifying the still-uncertain responsibilities of digital enterprises[540].

From this perspective, labour law provides a particularly promising lens, as it is capable, unlike other branches of law, of unveiling the genuine business models adopted by digital platforms, which are primarily designed to maximise profits through the externalisation of production costs[541].

Indeed, the protective framework offered by labour law enables a comprehensive understanding of the challenges posed by the digital revolution.

It adopts an inclusive approach that embraces the overall welfare of the economic system and upholds non-negotiable values such as solidarity, human dignity, and workers' health, values which stand in an "asymmetric" relationship to individual economic freedom[542].

Lastly, it is worth referring to two further judgments concerning the issue of employment classification (and the corresponding protections), one involving a courier working for the *CitySprint* platform and the other concerning a rider engaged by *Deliveroo*.

While the former case is broadly consistent with the conclusions reached by the Employment Tribunal in *Uber*[543], the latter adopted a markedly different approach.

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[538] R. CALO, A. ROSENBLAT, "*The Taking Economy: Uber, Information, and Power*", 117, in Columbia Law Review, 2017, p. 1625.

[539] D. SCHLAGWEIN, R. SCHODER, K. SPINDELREHER, "*Consolidated, systemic conceptualization, and definition of the "sharing economy"*", in JASIST, 2020, p. 829.

[540] V. ZENO-ZENOVICH, "*Uber: modello economico e implicazioni giuridiche*", in RDM, 2018, p. 142.

[541] A. TODOLI'-SIGNES, "*The End of the Subordinate Worker? The On-Demand Economy, the Gig Economy, and the Need for Protection for Crowdworkers*", in IJCCLIR, 2017, p. 242.

[542] G. SANTORO-PASSARELLI, "*Il diritto del lavoro a cinquanta anni dallo statuto dei lavoratori*", in RIDL, 2020, p. 101.

[543] *The Employment Tribunal of London, 5 january 2017, Dewhurst v. CitySprint UK Ltd*., in EW, n. 2202512/2016; V. PAPA, "*Economia digitale e lavoro on demand tra scenari futuristici e fughe all'indietro*", in Impresa, lavoro e non lavoro nell'economia digitale, *cit*, 506, where it is observed that in the decision "prominent weight appears to have been assigned to the extensive power of control exercisable, and in practice *exercised, by the supervisors over the delivery workers' performance through electronic means, so much so that the judges were able to describe the supervisors as 'chess players moving pieces [knights] on the board"*.

In the *Deliveroo* case, the Independent *Workers' Union of Great Britain* (*IWGB*) sought recognition of a collective bargaining unit; however, both the *Central Arbitration Committee*[544] and the *High Court*[545]rejected the claim.

The decision was grounded on the existence of a substitution clause within *Deliveroo*'s contracts[546], which allowed riders to appoint substitutes at their discretion.

This clause was deemed sufficient to classify them as self-employed contractors rather than "*workers*", thereby excluding them from the scope of specific collective labour legislation. Such an interpretation has been the subject of strong academic criticism[547] for its failure to adhere to the jurisprudential principles established in *Autoclenz Ltd v Belcher*, which would instead have regarded the substitution clause as excessively burdensome for the riders and, consequently, would have warranted their classification as "*workers*".

At a more advanced stage, the judicial debate surrounding this category of workers[548] has also given rise to significant reflections on the protection of health and safety at work.

In this regard, the judgment delivered by the *Administrative Division of the High Court of Justice* in *IWGB v Secretary of State for Work and Pensions and Others* underscored, notwithstanding the implications of *Brexit*, the continued centrality of the EU Directive on occupational health and safety, drawing specifically upon Directive 89/391/EEC.

To begin with, it must be emphasised that the *Independent Workers' Union of Great Britain* represents workers operating in the *gig economy* and in precarious employment, many of whom are migrants or individuals particularly exposed to the risks of COVID-19 illness. The legal action was thus prompted by the demands of these workers, especially couriers and logistics personnel, to obtain adequate personal protective equipment, which they had requested through their trade union.

In this instance, the *IWGB*'s Legal Department, which had already initiated various proceedings aimed at achieving legal reclassification of such workers[549], brought an action

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[544] *Central Arbitration Committee*, 14 November 2017, *Independent Workers' Union of Great Britain (IWGB) v RooFoods ("Deliveroo")***,** No. TUR1/985.

[545] *High Court of England and Wales*, 5 December 2018, *Independent Workers' Union of Great Britain (IWGB) v RooFoods ("Deliveroo")***,** in EWHC No. 3342, Case No. CO/810/2018.

[546] *Central Arbitration Committee*, 14 November 2017**,** *Independent Workers' Union of Great Britain (IWGB) v RooFoods ("Deliveroo")*, No. TUR1/985, para. 100.

[547] V. PIETROGIOVANNI, "*L'importanza di chiamarsi lavoratori, ovvero delle corti del Regno Unito alle (p)rese con il lavoro a chiamata attraverso le piattaforme*", *cit*., p. 60. In support of the argument advanced by the *Central Arbitration Committee* is M. BIASI, "*Uno sguardo oltre confine: "I nuovi lavori" della gig economy. Potenzialità e limiti della comparazione*", in LLI, 2018, 4, 2 p. 13.

[548] G. DAVIDOV, M. FREEDLAND, N. CONTOURIS, "*The subjects of labor law: 'Employees' and other workers*", in M.W. FINKIN, G. MUNDLAK (a cura di), Comparative Labor Law, Edward Elgar, 2015, pp. 115-131.

directly against the British State. It contended that the United Kingdom had failed to properly transpose European directives on occupational health and safety, in particular Framework Directive 89/391/EEC and Directive 89/656/EEC on personal protective equipment[550].

According to the union, the United Kingdom had implemented only those European provisions applicable to employees, thereby excluding the broader category of "*workers*" encompassed by the EU directives[551]; consequently, platform workers, albeit effectively under employer control, would be deprived of the protections afforded in respect of health and safety.

In response, the UK Government advanced two principal arguments.

On the one hand, it contended that the definition of "*worker*" contained within the European directives corresponds to that of an "*employee*" under domestic law; on the other hand, it asserted that, even if the concept were to be extended to include "workers", the protections already afforded to them would suffice to meet the minimum standards required under EU law.

The judge, having clarified that European law continues to retain relevance within UK domestic law even post-*Brexit*[552], proceeded to reconstruct in detail the EU regulatory framework on health and safety, starting from the Treaties and article 31 of the *Charter of Fundamental Rights of the European Union*, which safeguards fair and equitable working conditions. Such an analysis seeks, in essence, to delineate more precisely the notion of "worker" and the scope of the protections envisaged.

The judgment further references the most significant EU case law in the field, although it does not consider the recent decision in *B. v Yodel Delivery (C-629/19)*[553], which excluded the applicability of the *Working Time Directive* (Directive 2003/88/EC) to *gig workers*.

Subsequently, the judge, having examined UK health and safety legislation, turned to the merits of the *IWGB*'s action. In this respect, the union grounded its argument in a *purposive*

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[549] V. PIETROGIOVANNI, "*L'importanza di chiamarsi lavoratori, ossia delle Corti del Regno Unito alle (p)rese con il lavoro a chiamata sulle piattaforme*", *cit*, pp. 45-67.

[550] See, in this regard, A. CEFALIELLO, N. COUNTOURIS, "*Gig workers' rights and their strategic litigation*", in Social Europe, 22 december 2020.

[551] G. PACELLA, "*La nozione euro-unitaria di lavoratore dipendente alla prova della gig-economy: si pronuncia la Corte di Giustizia europea*", in LLI, 2020, 1, pp. 16-32.

[552] This was made possible through the *European Union (Withdrawal) Act 2018*, which extended the application of the European Communities Act until the conclusion of the United Kingdom's withdrawal from the European Union, set for 31 December 2020.

[553] J. ADAMS-PRASSL ET AL., "*La Corte di Giustizia dell'Ue prende tempo? L'ordinanza Yodel e le sue (scarse) implicazioni per il lavoro tramite piattaforma*", in RGL, 2020, 3, pp. 399-414.

approach, oriented towards the objectives pursued by the directives, highlighting the use of the term "*any worker*" rather than "*employee*" in EU legislation[554].

The *IWGB* further advanced two possible interpretations of the term "*worker*": one contingent upon national definitions, and a second, supported by scholars such as *Nicola Contouris*[555], which proposes an autonomous and expansive interpretation consistent with the Treaties.

According to the union, the latter interpretation precludes Member States from arbitrarily excluding "workers" from the protections envisaged.

Conversely, the UK Government proposed a third interpretative route, asserting that the health and safety directives articulate a specific and autonomous notion of "*worker*", distinct both from that contained in the Treaties and domestic law.

Attention was drawn, moreover, to the expression "*employed by*", interpreted as an explicit reference to the employment relationship, with the definition of "*employer*" ("*any natural or legal person responsible for the undertaking or establishment*"[556]) reinforcing such a construction.

Ultimately, the Government maintained that the distinction between protections for employees and workers is not arbitrary, being grounded in objective reasoning, noting that the European Commission has never challenged the UK's position on this point.

The Court, therefore, after reconstructing the framework as outlined, examined the notion of "*worker*", which lies at the heart of the case. Particular attention was paid to the interpretation of article 3 of Directive 89/391/EEC, commonly referred to as the "*Framework Directive*" on health and safety at work.

The Court, whilst acknowledging the existence of a wide array of definitions of "*worker*" within European law, upheld the position of the UK Government that the Directive adopts a specific conception. Nonetheless, it also emphasised that such a conception possesses a broader and autonomous scope compared to domestic law, given that, whenever the European legislator intended to refer to national law, it did so explicitly[557]. Consequently, the Directive must be interpreted uniformly across all Member States, thereby avoiding disparities in protection that could affect both competition and occupational health and safety conditions.

Accordingly, in the Court's view, the interpretation of the notion of "*worker*" should not be restrictive; rather, it must align with the overarching objective of the Directive, as enshrined

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[554] G. DAVIDOV, "*A Purposive Approach to Labour Law*", Oxford, Oxford University Press, 2016.

[555] N. CONTOURIS, "*The Concept of "Worker" in European Labour Law: Fragmentation, Autonomy and Scope*", in ILJ, 2018, 2, pp. 192-225.

[556] See, in this regard, article 3, paragraph 1, letter (b) of Directive 391/89/EEC.

[557] See, in particular, articles 8, 10, 11 and 12 of the Directive.

in article 1, namely to enhance the protection of health and safety for all workers. Moreover, reference to the "*responsibility of the employer in relation to the undertaking or establishment*" cannot serve to limit this scope, since such responsibility may also exist outside the context of traditional employment.

To support this interpretation, the judgment cites numerous precedents of the *Court of Justice of the European Union*, including *Lawrie-Blum*, *Allonby*, and *Fenoll*, as well as article 31 of the Charter of Fundamental Rights of the European Union, which safeguards the right to fair and just working conditions.

On the basis of these considerations, the Court concluded that the UK's implementation of the Directive is not fully compliant, insofar as it restricts protection to employees alone, thereby excluding workers; it follows that it must be assessed whether the guarantees afforded to the latter suffice to meet the minimum standards established by EU law.

Whereas the claimants contend that this assessment must yield a negative conclusion, given that UK law has allegedly failed to implement several fundamental provisions of the health and safety Directives, the Government argues that, even if the legislation does not explicitly extend all protections to workers, it nonetheless provides an adequate level of protection, including obligations of risk prevention and assessment applicable also to individuals who are not direct employees[558].

The Court, however, held that such an extension is insufficient, particularly with regard to article 8 of the *Framework Directive*, which guarantees protection to workers in the event of serious and immediate risks. Similarly, recourse to whistleblowing provisions (i.e., "*protected disclosure*") cannot be deemed equivalent, since while these offer protection to those reporting irregularities, they do not specifically address situations in which a worker must remove themselves from imminent danger.

The same reasoning applies to article 3 of the *Personal Protective Equipment* (*PPE*) Directive, which under UK law tends to protect employees only, rather than workers more broadly. Since domestic law imposes no obligation to provide *PPE* to workers outside traditional employment, the Court concluded that the UK's implementation of the Directive is non-compliant with EU law, rendering such workers vulnerable in circumstances where they ought to enjoy statutory protections.

[558] Reference is made, in particular, to *Sections 2, 3 and 4 of the Health and Safety at Work Act 1974* and to *Regulation 3 of the Management of Health and Safety at Work Regulations 1999*, the *Workplace Regulations 1992*, the *Work Equipment Regulations 1998*, and the *Carriage Regulations 2009*.

In conclusion, the analysis of this judgment reveals that, although occupational health and safety legislation has exhibited signs of flexibility and adaptation, it nonetheless requires substantial reform in order to effectively respond to the complexities of contemporary work. Extending protection does not merely entail redefining the notion of "*worker*"; it requires recognition, from the outset, of all emerging forms of work that elude conventional patterns of subordination and control. The true challenge, therefore, lies in establishing a system of protections that is genuinely universal and adaptable, ensuring effective health and safety safeguards for all workers, irrespective of their legal classification[559].

[559] E. DAGNINO, "*L'ambito applicativo delle tutele in materia di salute e sicurezza sul lavoro Spunti da una sentenza d'oltremanica tra piattaforme e lavoro precario*", in IRIS Unimore, 2021, 2, pp. 10-11, 15.

CHAPTER FOUR

The Impact of Artificial Intelligence on work in digital platforms: contextualisation, challenges, and effects on workers' health and safety.

1. Introduction.

Having concluded the discussion on the legal classification of work performed via digital platforms, it is now appropriate to focus on the element that most distinctly characterises it, namely, *algorithmic management*.

In recent years, algorithmic management and digital surveillance have assumed a central role in the organisational models of platforms, representing the transfer of functions traditionally performed by human managers to intelligent machines, with the aim of enhancing efficiency, productivity, and competitiveness of the company operating the digital platforms[560].

Through automated systems for task allocation, monitoring, and performance evaluation, platforms exercise managerial control capable of profoundly reshaping employment relationships and the traditional balance of power between employer and worker.

This results in a paradoxical combination of autonomy and subordination: while workers may appear free to choose the timing and manner of task execution, the pervasive use of algorithms and evaluation mechanisms, such as rating systems, *GPS* tracking, gamification, and nudging, effectively constrains their autonomy, generating constant pressure, internal competition, and workload intensification.

The opacity of algorithmic processes, combined with the increasing automation of decision-making, significantly reduces workers' ability to understand or challenge decisions that affect them. Despite potential opportunities and benefits, the risks include job loss and substitution of human labour, the exacerbation of contractual vulnerability, algorithmic bias[561] and

[560] J. PRASSL, "*Regulating Algorithms at Work: Lessons for a 'European Approach to Artificial Intelligence*", in ELLJ, 2022, vol. 13, n. 1, pp. 30 ss.

[561] C. ALESSI, "*Lavoro tramite piattaforma e divieti di discriminazione nell'UE*", in C. ALESSI, M. BARBERA, L. GUAGLIANONE (a cura di), Impresa, lavoro e non lavoro nell'economia digitale, Cacucci, 2019, 695; M. PERUZZI, "*Il diritto antidiscriminatorio al test di intelligenza artificiale*", in Questioni di diritto del lavoro, 7, n. 1, 2021; ID, "*Intelligenza artificiale e diritto. Uno studio su poteri datoriali e tecniche di tutela*", Giappichelli, 2023.

technological or historical prejudice[562], heightened dehumanisation of work relations, and opacity in organisational and managerial decisions.

These dynamics directly impact workers' psychosocial well-being, fostering stress, anxiety, and a loss of trust in the organisation. In this context, new challenges arise concerning the protection of rights, organisational justice, and occupational health and safety, making regulatory intervention imperative to ensure greater transparency, human oversight, and avenues for recourse, as envisaged in the European proposal on improving working conditions in digital platform work[563].

2. Evolution of workforce management: from the industrial revolution to algorithmic governance.

2.1. Historical perspectives on work management.

Before delving into the concept of algorithmic management of work performance through artificial intelligence systems, it is appropriate to briefly retrace the evolutionary stages concerning the management of workers.

According to several scholars[564], workforce management reflects the process of supervising and controlling employees to achieve business objectives more effectively, focusing on the ways in which productivity could be improved, efficiency increased, staff turnover reduced, and, above all, the safety and well-being of workers ensured.

This process typically encompasses a range of activities, including monitoring, surveillance, control, and the establishment of systems of reward and punishment.

The origins of modern, organised labour management, where the work activity of employees was governed by specific organisational schemes or guidelines rather than carried out in an improvised manner, date back to the late eighteenth century, with the advent of the Industrial

[562] In this respect, historical discrimination originates from the inherent capacity of artificial intelligence systems to draw upon and codify historical data in the development of their decision-making models, thereby reproducing and perpetuating past patterns. As a result, any biases or value-laden judgements embedded within the input data risk being magnified through the system's operational processes. Cfr. G. RESTA, "*Governare l'innovazione tecnologica: decisioni algoritmiche, diritti digitali e principio di uguaglianza*", in Politica del diritto, 2019, pp. 199 ss.

[563] EU-OSHA, "*Digital platform work and occupational safety and health: overview of regulation, policies, practices and research*", in Eu-Osha, 2022, pp. 21-24.

[564] H. KOONTZ, C. O'DONNELL, "*Principles of management: An analysis of managerial functions*", McGraw-Hill, 1955; N. RICHMAN, "*Human resource management and human resource development: Evolution and contributions*", Creighton Journal of Interdisciplinary Leadership, 2015, 1(2), pp. 120-129.

Revolution and the shift from agricultural to industrial production[565]. During this period, and throughout the early decades of the nineteenth century, labour management was primarily authoritarian: workers' productivity was often secured through the fear of job loss or, in some instances, even physical coercion[566], while concerns relating to health and safety were virtually non-existent.

A turning point occurred at the end of the nineteenth century, when increasing disputes between workers and managers, together with the rise of trade unions, prompted many executives to adopt less rigid practices, such as the introduction of reward systems and the abolition of physical punishment[567].

It was indeed towards the end of the nineteenth and the beginning of the twentieth century that several scientific management methods were developed, among which one of the most influential was that devised by *Frederick W. Taylor*, who systematised work through a scientific analysis capable of determining what constituted a "*satisfactory working day*" for employees[568], while also advocating for closer supervision to ensure that mistakes were not made[569].

Another approach from the same period was that of *Henri Fayol*, who elaborated his managerial theory known as *Fayolism*, centred on strict monitoring and control of workers[570]: whereas *Taylorism* focused on management from the workers' perspective, Fayolism emphasised a top-down approach, starting from corporate goals[571].

Alongside these, other theories emerged, such as *Max Weber*'s bureaucratic management[572] and *Elton Mayo*'s human relations theory[573].

After the Second World War, the use of mathematical and statistical models by the military for workforce management was adapted to the management of civilian workers, adopting an

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[565] D.L. DEADRICK, D.L. STONE, "*Human resource management: Past, present, and future*", in HRMR, 2014, 3(24), pp. 193-195.

[566] D.L. DEADRICK, "*Human resource management: Past, present, and future*", *cit.*; S.H. SLICHTER, "*The turnover of factory labor*", Appleton, 1919.

[567] W. PINDUR, S.E. ROGERS, P.S. KIM, "*The history of management: A global perspective*", in JMH, 1995, 1(1), pp. 59-77.

[568] D.L. DEADRICK, "*Human resource management: Past, present, and future*", *cit.*, W. PINDUR, S.E. ROGERS, P.S. KIM, "*The history of management: A global perspective*", *cit.*

[569] D.L. DEADRICK, "*Human resource management: Past, present, and future*", *cit.*

[570] K. BALL, "*Workplace surveillance: an overview*", in Labor History, 2010, 51(1), pp. 87-106; M.G. PRYOR, S. TANEJA, "*Henri Fayol, practitioner and theoretician – Revered and reviled*", in JMH, 2010, 16(4), pp. 489-503.

[571] C. GEORGE, "*The history of management thought*", Prentice Hall.

[572] S. SERPA, C.M. FERREIRA, "*The concept of bureaucracy by Max Weber*", in IJSSS, 2019, 7(2), pp. 12-18.

[573] K. BRUCE, C. NYLAND, "*Elton Mayo and the deification of human relations*", in Organization Studies, 2011, 32(3), pp. 383-405.

approach based on the exploitation of quantitative data and statistical analysis[574], primarily employed to address issues of planning and resource allocation[575].

This practice became increasingly common from the 1960s onwards, with the spread of computers within organisations[576].

Indeed, the use of computers, and digitalisation more broadly, enabled companies to monitor and control employees in a more detailed and intensive manner, collecting information on their behaviour and generating permanent records accessible to managers at any time[577].

These technological advancements also contributed to the transfer of work into the digital space[578], enabling the emergence of new forms of employment such as teleworking, remote work, platform work or the gig economy, and other flexible working arrangements, whereby an increasing number of people began to work in locations other than traditional offices, factories, or shops[579].

Such developments allowed companies to recruit a global workforce and thereby enhance their productivity[580], which, together with the rapid progress of digitalization, paved the way for new methods of workforce management in the twenty-first century, one of which, now rapidly expanding, involves the use of algorithms and artificial intelligence to manage workers' activities[581].

2.2. ***Artificial intelligence: key features and operational categories.***

At present, although the term *artificial intelligence* (AI) remains a highly elastic concept among scholars, professionals, journalists, and enterprises alike, there is, nevertheless, no single, universally accepted definition of it[582].

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[574] W. PINDUR, "*The history of management: A global perspective*", *cit*.

[575] S .P. ROBBINS, M.K. COULTER, "*Management*" (14th ed.), Pearson, 2018.

[576] W.F. CASCIO, R. MONTEALEGRE, "*How technology is changing work and organizations*", Annual Review of Organizational Psychology and Organizational Behavior, 2016, 3, pp. 349-375.

[577] I. AJUNWA, K. CRAWFORD, J. SCHULTZ, "*Limitless worker surveillance*", in CLR, 2017, 105(3), pp. 735-776; D. McLVER, M.L. LENGNICK-HALL, C.A. LENGNICK-HALL, "*A strategic approach to workforce analytics: Integrating science and agility*", Business Horizons, 2018, 61(3), pp. 397-407.

[578] P.J. HOLLAND, B. COOPER, R. HECKER, "*Electronic monitoring and surveillance in the workplace*", in PR, 2015, 44, pp. 161-175.

[579] A. MATEESCU, A. NGUYEN, "*Explainer: Algorithmic management in the workplace*", in Data & Society, 2019.

[580] S. McINTOSH, "*A guide to remote working and virtual teams*", Sage Advice, 2018.

[581] M.I. JORDAN, T.M. MITCHELL, "*Machine learning: Trends, perspectives, and prospects*", in Science, 2015, 349(6245), pp. 255-260.

[582] A. DE MAURO, M. GRECO, M. GRIMALDI, "*What is big data? A consensual definition and a review of key research topics*", in AIP Conference Proceedings, 2015, 1644(1), pp. 97-104; P. WANG, "*On defining artificial intelligence*", in JAGI, 2019, 10(2), pp. 1- 37; OECD, "*Artificial intelligence in society*", in OECD Publishing, 2019.

In this regard, on the one hand, some describe AI in general terms as a technology that seeks to imitate human intelligence[583], while, on the other, others have attempted to adopt a more technical definition, such as that proposed by the *European Commission's High-Level Expert Group on Artificial Intelligence*, which defines AI as: "*...software systems (and potentially also hardware) designed by humans that, given a complex goal, act in the physical or digital dimension by perceiving their environment through data acquisition, interpreting the collected structured or unstructured data, reasoning on the derived information, and deciding on the best actions to take to achieve the given goal*" [584]. On this basis, the European Commission, in its 2021 proposal for a harmonised regulation on AI (the so-called *Artificial Intelligence Act*), suggested a definition that "*aims to be as technology-neutral and future-proof as possible*"[585].

According to this proposal, "*...an 'artificial intelligence system' (AI system) means software that is developed with one or more of the techniques and approaches listed in Annex I (of the proposal) and that can, for a given set of human-defined objectives, generate outputs such as content, predictions, recommendations or decisions influencing the environments they interact with*"[586].

The relevant techniques and approaches include, as noted above, *machine learning*, logic- and knowledge-based methods, and statistical approaches[587].

More generally, for an AI system to function effectively, the *OECD* identifies three fundamental components: data, algorithms, and *hardware*[588].

The first refers to the information upon which AI operates, often collected or extracted from the surrounding environment; such data may originate from machines (for instance, through sensors) or from human sources (such as employee interviews), and can be either structured (e.g. *tabular data*) or unstructured (e.g. *textual data*).

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[583] R. FJELLAND, "*Why general artificial intelligence will not be realized*", in Humanities and Social Sciences Communications, 2020, 7, Article 10.

[584] High-Level Expert Group on Artificial Intelligence, "*A definition of artificial intelligence: Main capabilities and scientific disciplines*", in European Commission, 2019a, p. 6.

[585] EUROPEAN COMMISSION, "*Proposal for a regulation of the European Parliament and of the Council – laying down harmonised rules on Artificial Intelligence (Artificial Intelligence Act) and amending certain union legislative acts*", in European Commission, COM(2021) 206 final, p. 12.

[586] EUROPEAN COMMISSION, "*Proposal for a regulation of the European Parliament and of the Council – laying down harmonised rules on Artificial Intelligence (Artificial Intelligence Act) and amending certain union legislative acts*", *cit*. 2021, p. 39.

[587] EUROPEAN COMMISSION, "*Proposal for a regulation of the European Parliament and of the Council – laying down harmonised rules on Artificial Intelligence (Artificial Intelligence Act) and amending certain union legislative acts*", *cit*., 2021.

[588] OECD, "*Artificial intelligence in society*", *cit*., pp. 22-24.

The second denotes a set of precise instructions that describe how a computer should perform a given task, solve a problem, or manage the collected data[589].

In AI systems, moreover, algorithms can be autonomously generated through *machine learning*: in essence, AI employs complex mathematical formulas to create algorithms capable of interpreting data and using it to make decisions, generate predictions, or provide recommendations.

Finally, *hardware* concerns the physical devices that collect and analyse data, acting upon it through actuators that execute actions based on the information received.

Beyond this description, it must be emphasised that, although these three components constitute the essential elements of any AI system, not all systems employing them can necessarily be classified as *artificial intelligence* in the strict sense.

In this regard, there exist simple systems that employ data, algorithms, and hardware without, however, possessing any genuine form of "*intelligence*".

Such systems, based on straightforward algorithms, may adapt to their environment without requiring artificial intelligence. For instance, a modern thermostat is capable of regulating heating intensity in accordance with the external temperature[590] and, although it can hardly be described as "*intelligent*", it clearly exhibits a degree of adaptability.

To distinguish between *intelligence* and *adaptability*, and between AI and simple algorithmic systems, intelligence in artificial intelligence may be defined as "*the ability of an information-processing system to adapt to its environment while operating with incomplete knowledge and limited resources*"[591].

The key element in this definition lies in the phrase *incomplete knowledge and resources*: intelligent systems, in fact, do not know the correct solution in advance, nor do they possess sufficient resources (such as computational power, data, or time) to determine an exact answer[592]. Rather, they are capable of adapting and producing the best possible approximation of the correct response, whereas a simple algorithm provides a precise, predetermined output.

Returning to the example of the thermostat, although it is not intelligent, it employs a simple algorithm that adjusts the internal temperature in a pre-programmed manner according to external climatic variations.

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[589] P. DOURISH, "*Algorithms and their others: Algorithmic culture in context*", in Big Data & Society, 2016, 3(2).

[590] K. HUANG et al., "*Self-learning algorithm to predict indoor temperature and cooling demand from smart WiFi thermostat in a residential building*", in Sustainability, 2020, 12(17), Article 7110.

[591] P. WANG, *"On defining artificial intelligence"*, in JAGI, 2019, 10(2).

[592] P. WANG, *"On defining artificial intelligence"*, *cit*.

This distinction is closely connected to the concepts of *deterministic* and *non-deterministic* AI: while a deterministic system always produces the same result from an identical input, a non-deterministic one may generate different outcomes depending on its interaction with the environment[593].

Broadly speaking, AI can be categorised into two main types: *symbolic* and *sub-symbolic*. The former encompasses all systems in which intelligence is explicitly programmed using symbols, that is, human-comprehensible logic and knowledge that can be translated into computer code[594], thus operating under close human supervision and requiring manual intervention to learn.

The latter, by contrast, refers to approaches in which systems autonomously "discover" how to achieve a particular outcome from a given input, often with minimal or no human involvement[595].

Such systems learn from the data available to them, as in the case of *machine learning* and *deep learning*, which rely on artificial neural networks to emulate the functioning of the human brain[596].

In some respects, these categories also mirror the distinction between deterministic and non-deterministic AI: symbolic AI tends to be deterministic, while sub-symbolic AI is generally non-deterministic[597]; historically, symbolic AI, once the dominant paradigm, reflected the use of simple, rule-based algorithms, whereas recent developments in sub-symbolic AI correspond to the rise of probabilistic and data-driven approaches.

Another useful perspective for understanding how AI operates concerns the nature of the outputs it is capable of producing.

In this regard, the report by the *Robert-Sauvé* Institute on occupational health and safety[598] classifies AI into three principal categories.

The first, known as "*perception*", focuses on AI methodologies for data collection, for instance through sensors or computer vision, enabling computers to interpret images and

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[593] T. CORMEN et al., "*Introduction to algorithms*", MIT Press, 2009.

[594] A. GARCEZ, L. LAMB, "*Neurosymbolic AI: The 3rd wave*", in ArXiv, abs/2012.05876, 2020; G. LIMA, R. COSTA, M. MORENO, "*Semantics and multimedia: An introduction to symbolic artificial intelligence applied to multimedia*", in Proceedings of the 25th Brazillian Symposium on Multimedia and the Web, 2019, 7-9; A. SANTORO et al., "*Symbolic behaviour in artificial intelligence*", in ArXiv preprint arXiv:2102.03406, 2021.

[595] E. ILKOU, M. KOUTRAKI, "*Symbolic vs sub-symbolic AI methods: Friends or enemies?*", in Proceedings of the CIKM 2020 Workshops, CEUR Workshop Proceedings, 2020.

[596] I GOODFELLOW, Y. BENGIO, A. COURVILLE, "*Deep learning*", 2017, 1, The MIT Press; N. SHARMA, R. SHARMA, N. JINDAL, "*Machine learning and deep learning applications-A vision*", in Global Transitions Proceedings, 2021, 2(1), pp. 24-28.

[597] S. RUSSELL, P. NORVIG, "*Artificial intelligence: A modern approach*", Pearson, 2020.

[598] M. CPOMEAU, "*Intelligence artificielle en santé et SST*", Institut de recherche Robert-Sauvé en santé et en sécurité du travail, 2021.

video. The second, referred to as "*understanding*", encompasses AI methods aimed at interpreting data to provide diagnoses (explaining why an event occurred) or predictions (estimating what might happen in the future).

The third category, termed "*decision-making*", concerns AI approaches that allow for resolving specific situations by suggesting appropriate actions or automating their execution; this includes, for example, robotic systems capable of collecting, interpreting, and making decisions based on certain data.

In conclusion, it may be stated that perception-based AI tools address the question "*what is happening?*", understanding-oriented tools answer "*why is it happening?*", while decision-focused tools respond to "*how should the identified issue or problem be addressed?*".

3. AI in workforce management: challenges and implications for health and safety.

Building on the foregoing premises, it is pertinent to examine the operational mechanisms of workforce management systems within organisations increasingly dominated by artificial intelligence.

Artificial Intelligence in Worker Management (*AIWM*) represents a system capable of gathering data, often in real time, from the work environment, the employees themselves, and the activities they undertake. This information is subsequently processed by AI to produce automated or semi-automated decisions, or to inform those responsible for decision-making, be they human resources managers, employers, or occasionally the workers themselves, on various aspects of workforce administration[599].

The decisions and recommendations generated within such systems may encompass a wide range of domains, including the organisation of work schedules, task allocation, performance evaluation, monitoring of worker activity, and the implementation of measures aimed at safeguarding occupational health.

Organisations employing *AIWM* generally seek to automate select functions, thereby enhancing productivity and employee engagement, optimising workflow, refining task

[599] EUROPEAN PARLIAMENTARY RESEARCH SERVICES, "*Data subjects, digital surveillance, AI and the future of work*", in European Parliament, 2020a; HIGH-LEVEL EXPERT GROUP ON ARTIFICIAL INTELLIGENCE, "*A definition of artificial intelligence: Main capabilities and scientific disciplines*", in European Commission, 2019a; EUROPEAN AGENCY FOR SAFETY AND HEALTH AT WORK (EU-OSHA) "*OSH and the future of work: Benefits and risks of artificial intelligence tools in workplaces*", Discussion paper, 2019.

distribution, managing human resources[600], and, crucially, promoting the health, safety, and overall well-being of the workforce[601].

AIWM also incorporates algorithmic management, which leverages algorithms to assign and monitor tasks, assess performance and behaviour, and implement decisions either automatically or semi-automatically[602].

The operational process of *AIWM* can be understood through a sequence of stages that culminate in predictions, recommendations, or decisions.

As highlighted by sources such as the *OECD*[603], and corroborated by academic research, the first stage entails *data collection*, capturing information about employees, their environment, and the tasks performed, often through monitoring or surveillance systems[604].

Next, the data undergoes processing, transforming it into a format suitable for AI interpretation; this may involve extracting salient information from textual sources, structuring datasets into tabular forms, and performing the statistical analyses required by the AI model.

Subsequently, the processed data is fed into the system, which generates outputs in the form of predictions, recommendations, or decisions pertaining to workforce management.

Lastly, the output is disseminated to the relevant actors, whether human or machine, enabling adjustments to work organization, such as modifying task execution, reconfiguring the workspace, or refining workforce management practices, and, in some cases, informing reward or incentive mechanisms.

It is noteworthy that that *AI-based* monitoring exhibits four substantial differences compared to traditional surveillance methods.

Firstly, there is the "*near-inescapability*" of such monitoring, given its integration within work processes and devices, as exemplified by facial recognition, wearable devices, sensors in the work environment, and the tracking of online activities.

Secondly, the dimension of "*breadth*" must be highlighted, as these systems can gather vast quantities of data from multiple sources, including activities outside the workplace, such as employees' social media posts. Thirdly, the attribute of "*immediacy*" is significant, with data

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[600] M. LANE, A. SAINT-MARTIN, "*The impact of artificial intelligence on the labour market: What do we know so far?*", in OECD Social, Employment and Migration Working Papers, 2021, No. 256.

[601] A. BADRI, B. BOUDREAU-TRUDEL, A.S. SOUISSI, "*Occupational health and safety in the industry 4.0 era: A cause for major concern?*", in Safety Science, 2018, 109, pp. 403-411.

[602] P. BERASTEGUI, "*Exposure to psychosocial risk factors in the gig economy: A systematic review*", European Trade Union Institute, 2021; EUROPEAN AGENCY FOR SAFETY AND HEALTH AT WORK, "*Monitoring technology: The 21st century's pursuit of wellbeing*", in Oshwiki, 2018.

[603] OECD, "*Artificial intelligence in society*", OECD Publishing, 2019.

[604] S. RUSSELL, P. NORVIG, "*Artificial intelligence: A modern approach*", Pearson, 2020.

being collected and analysed in real time. Lastly, "*interactivity*" allows feedback to be communicated instantly, a feature that may be misused by employers.

Regarding the operational mechanisms of *AIWM* systems, it should be observed that worker management encompasses both control and support systems, which are not mutually exclusive, as many organisations employ both approaches concurrently.

In particular, with respect to "*control*". algorithmic management, like any worker management system, centres on the three mechanisms of "*direction*", "*evaluation*", and "*discipline*", which can, in turn, be subdivided into six sub-mechanisms according to the so-called "*6R*" model, and may be either automated or semi-automated[605].

In essence, "*direction*" determines what must be done, in which order, and within what timeframe, with varying degrees of precision, and is implemented through recommendations and constraints that guide employees' actions or restrict certain behaviours[606].

"*Evaluation*" involves monitoring and reviewing employee performance, often incorporating predictive assessments, with the aim of rectifying errors, measuring output, and identifying those who are inadequately suited for specific tasks[607].

"*Discipline*" entails systems of rewards and/or penalties designed to motivate employees and ensure compliance with organisational directives, potentially resulting in the replacement of underperforming staff or the recognition of high achievers[608].

With regard to "*support*", *AIWM* encompasses mechanisms that assist workers in performing their duties more effectively, enhancing communication and collaboration[609], and may include tools aimed at preventing workplace conflict, bullying, or favouritism, such as systems identifying emotional[610] stress, thereby improving both *engagement* and productivity[611].

Nevertheless, the risks associated with the management of workers through artificial intelligence systems should not be underestimated, particularly those of a psychosocial nature.

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[605] K.C. KELLOGG, M.A. VALENTINE, A. CHRISTIN, "*Algorithms at work: The new contested terrain of control*", in AMA, 2020, 14(1), pp. 366-410.

[606] K. C. KELLOGG, M. A. VALENTINE, A. CHRISTIN, "*Algorithms at work: The new contested terrain of control*", cit., pp. 366-410.

[607] K. C. KELLOGG, M. A. VALENTINE, A. CHRISTIN, "*Algorithms at work: The new contested terrain of control*", *cit*.

[608]K C, KELLOGG, M. A. VALENTINE, A. CHRISTIN, "*Algorithms at work: The new contested terrain of control*", *cit*.; see also F. HIRSCH et al, "*Algorithmic Control in Platform and Traditional Work Settings: An Algorithmic Control in Platform and Traditional Work Settings: An Updated Conceptual Framework Updated Conceptual Framework*", 2023, p. 4.

[609] PUBLICIES GROUPE, "*Publicis Groupe and Microsoft announce partnership for Marcel AI Platform*", in Publicies Groupe, 2018.

[610] P. A. KUMAR et al, "*The Influence of Emotional Intelligence on Employee Engagement and Productivity*", in Advances in Consumer Research, 2025; K. KUMPRANG, S. SURIYANKIETKAEW, "*Mechanisms of organizational mindfulness on employee well-being and engagement: a multi-level analysis*", in MDPI, 2024.

[611] P. BELTON, "*How does it feel to be watched at work all the time?*", in BBC News, 2019.

In particular, work intensification and the continuous monitoring of performance are responsible for increased levels of stress, burnout and the risk of occupational accidents, while the reduction of workers' decision-making autonomy may diminish job satisfaction and negatively affect mental health.

Moreover, the automation of management functions may give rise to feelings of social isolation and dehumanisation, reducing interaction with supervisors and limiting human support. The extensive collection of data on workers also raises concerns relating to privacy and trust, while the use of historical data may introduce biases and generate discriminatory outcomes, leading to unfair evaluations, excessive workloads and unsafe working conditions[612].

From a final perspective, with regard to the decision-making process, it is important to observe that *AIWM*, from a technical standpoint, can be employed to make either semi-automated or fully automated decisions.

In the case of semi-automated decisions, the tools do not act independently but merely provide data and recommendations, enabling responsible parties (such as *HR* managers) to make informed choices.

Fully automated decisions, on the other hand, are made entirely by computers and machines, without the need for human intervention.

Nonetheless, although this is technically feasible, at the EU level, as previously analysed, article 22 of the *GDPR* establishes that the data subject has the right not to be subject to a decision based solely on automated processing. Indeed, the degree of automation in a decision-making context significantly affects the impact that *AIWM* systems may have on workers' health and safety.

For instance, greater involvement of workers in the design and evaluation of *AIWM* systems, particularly concerning how the outputs are utilized, has been suggested[613], as this would

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[612] EU-OSHA, "*Worker management through AI: Opportunities and risks for occupational safety and health*", in Eu-Osha, 2025.

[613] In this regard, in order to effectively address the challenges posed by work in the platform economy, it is first necessary to emphasise that activities performed through platforms should be regarded as constituting employment relationships in all respects, with the consequent application of the legal protections afforded to employees. From this perspective, platforms should generally be classified as employers and included within existing systems of information, consultation and collective bargaining. In particular, a central strategy consists in integrating platform work into traditional collective structures, fostering trade union organisation also through the use of digital tools. Despite the geographical dispersion of workers, the use of digital technologies and social networks can facilitate collective mobilisation and the dissemination of information, as demonstrated by trade union experiences in several countries. Once organised, workers may thereby establish mechanisms of information and consultation with platforms and initiate processes of collective bargaining. Collective bargaining may address specific issues relating to platform work, such as the functioning of rating systems, pay transparency, dispute resolution mechanisms, the protection of personal data, and account deactivation

undoubtedly mitigate potential adverse effects, ensuring a more "*human-centred*" approach that respects and safeguards their rights and needs.

3.1. ***Spread and influence of algorithmic management across sectors.***

Against this backdrop, it becomes apparent that *AIWM* systems encompass a wide range of tools, techniques, and practices, making precise analysis of their prevalence challenging, particularly in the absence of a centralised database tracking their use. Moreover, some organisations may not fully comprehend which *AI-based* tools they are actually employing, or whether the software in use incorporates AI, particularly when acquired or leased from third parties[614], while other companies may be unwilling to disclose openly their use of such technologies[615].

Consequently, the adoption of *AIWM* is generally inferred from the implementation of AI or related technologies employed by organisations for workforce management.

It is estimated, moreover, that the use of AI technologies within companies is steadily increasing[616], although available data do not concur on the exact number of organisations actively employing them; for instance, it has been reported that approximately 58% of 2,395 companies surveyed in 2019 had adopted AI systems in at least one internal area of the organisation, including workforce management[617].

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procedures. See, in this regard, J. PRASSL, "*Collective voice in the platform economy: challenges, opportunities, solutions*", in ETUC, 2018, pp. 14-18. From the perspective of collective protection, the Platform Work Directive provides that operators of digital platforms are required to inform and consult workers' representatives as a matter of priority, or, in their absence, the workers themselves, particularly with regard to the introduction of, or substantial modifications to, automated monitoring and decision-making systems. Although the scope of information and consultation rights has been broadened through the removal of minimum size thresholds, the reference to modifications of a merely substantial nature may limit the overall effectiveness of this provision. Workers' representatives may also avail themselves of the assistance of experts, at the expense of the platform where it exceeds a certain size, and the relevant information must be provided in a timely manner, in line with the principles enshrined in the Charter of Fundamental Rights of the European Union. Furthermore, the Directive introduces innovative elements by recognising forms of representation that extend beyond those traditionally associated with standard employment relationships. Notwithstanding that such mechanisms constitute forms of so-called 'weak participation', such as information and consultation, there is a clear recognition of the need to intervene not only in relation to the individual employment relationship, but also at the stage of design and subsequent oversight of algorithmic systems that affect working conditions. To this end, the Directive encourages Member States to promote the role of the social partners and to foster collective bargaining in platform work, which is regarded as an appropriate instrument for regulating both employment relationships and self-employed work. See, in this regard, M. LAI, "*Brevi note sul lavoro tramite piattaforme digitali*", in Bollettino Adapt, 2025, n. 5, pp. 7-8.

[614] P. TAMBE, P. CAPPELLI, V. YAKUBOVICH, "*Artificial intelligence in human resources management: Challenges and a path forward*", in CMR, 2019, 61(4), pp. 15-42.

[615] T. CHAMORRO-PREMUZIC, "*Can surveillance AI make the workplace safe?*", in MIT Sloan Management Review, 2020, 62(1), pp. 13-15.

[616] JUNIPER NETWORKS, "*AI is set to accelerate... Is your organization ready?*", in Juniper Networks, 2021.

[617] McKINSEY, "*Global survey: The state of AI in 2020*", McKinsey Global Publishing, 2020, p. 2.

Similarly, an Oracle study found that roughly 50% of 8,370 *HR* leaders, managers, and employees interviewed across ten countries acknowledged using AI in some form at work in 2019[618]. However, despite 95% of 700 respondents, directly involved in the planning or deployment of AI and machine learning within their organizations, indicating that integrating AI into daily work could be beneficial, only 22% of organisations were actually using *AI-based* systems[619].

An even more striking example is highlighted in the *MMC Venture* report[620], which notes that only 1,580 out of 2,830 "*AI-based*" startups across 13 EU countries were actually employing AI. It has also been emphasised that, although statistics may suggest relatively widespread adoption, many organisations merely utilise simple algorithms while misattributing them as AI systems. Further insights can be drawn from *ESENER-3* and *ECS-2019*, which contain questions regarding digital technologies enabling *AIWM*. For example, *ESENER-3*, conducted in 2019, includes questions on various digital technologies that may facilitate *AIWM* and can thus serve as an indicator of its prevalence.

Excluding technologies such as personal computers and laptops, which are widely used by organisations without AI integration, a smaller number of workplaces employ technologies specifically associated with *AIWM*.

Weighted (normalized) and unweighted data yield similar results: for instance, only 4% of workplaces employ robots that interact directly with workers, while merely 12% utilise systems that determine the content and pace of work, with 8% employing systems for monitoring worker performance and 5% making use of wearable devices.

With regard to the sectors in which AI tools are deployed for workforce management, healthcare, logistics, and manufacturing emerge as the primary domains.

This is corroborated by *ESENER-3* data, which indicate that sectors such as agriculture, mining, and manufacturing more frequently utilise robots interacting with workers and systems that dictate the pace of work activities.

Conversely, the construction sector exhibits lower adoption rates.

ECS-2019 data present similar trends, revealing that approximately 68% of workplaces in mining and manufacturing employ machines or computers to regulate the pace of work,

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[618] ORACLE, "*From fear to enthusiasm: Artificial intelligence is winning more hearts and minds in the workplace*", in Oracle, 2019, p. 3.

[619] JUNIPER NETWORKS, "*AI is set to accelerate... Is your organization ready?*", *cit*., 2021, p. 3.

[620] MMC VENTURES, "*The state of AI: Divergence*", in MMC Ventures 2019, p. 99.

compared with lower percentages in other sectors, such as real estate (30%) and financial services (33%)[621].

Concerning the types of workers impacted by *AIWM* systems, those performing routine tasks are particularly susceptible[622]. Performance-monitoring systems are notably effective for manual, "*blue-collar*" workers, engaged in repetitive tasks of limited complexity that demand minimal creativity. Within this context, AI is employed to maximise productivity and ensure continuous oversight, enabling employers to monitor individual and collective performance, and to reward or penalise workers according to the aims achieved. Notable applications are found in sectors such as warehousing, retail, and delivery logistics, predominantly comprising low-wage, part-time, or precarious workers.

Specifically, in the warehousing and logistics sector, AI tools are deployed to optimise workflows, manage task allocation, and monitor employee performance.

Companies such as *Amazon*, for example, employ algorithms to assign tasks to warehouse operatives, track their productivity, and suggest the most efficient routes for product collection within the warehouse[623].

In the retail and delivery sector, particularly in low-skilled and low-paid roles, AI plays a pivotal role. Workers employed by companies such as *Uber Eats* or *Deliveroo*[624] are managed via applications that monitor their location, delivery times, and performance, also taking into account customer ratings. This constitutes a form of algorithmic management that exerts a highly intrusive level of control, being both stringent and continuous, imposing tight schedules and demanding the achievement of specific productivity targets[625].

In the manufacturing sector, AI similarly determines the pace of work through automated machinery and computerised systems, which dictate how and when tasks are to be performed; this approach aims to ensure efficiency and consistency in production, reducing human intervention to mere verification or supervisory tasks[626].

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[621] For a methodological overview of how *ESENER-3* is used, see Annex III, *European Survey of Enterprises on New and Emerging Risks* 2019 (*ESENER-3*) analysis; for a methodological overview of how *ECS-2019* is used see Annex IV, European Company Survey (ECS 2019) analysis, EU-OSHA, "*Artificial intelligence for worker management: an overview*", in Eu-Osha, 2022, p. 24 and pp. 75-84.

[622] EUROPEAN PARLIAMENT, "*Understanding algorithmic decision-making: Opportunities and challenges*", *European Parliamentary Research Service*, in European Parliament, 2019.

[623] T. DE LOMBAERT et al, "*Mass Collection of Workers' Data in Warehouse Facilities: Reflections on Privacy and Workforce Well being*", in ILLeJ, 2024, vol. 17.

[624] S. LEE, "*The "AI Mode": How Food Delivery Riders in the Netherlands and South Korea Experience Algorithmic Management*", in ILLeJ, 2024, vol. 17.

[625] P. TIMKO, R. VAN MELIK, "*Being a Deliveroo Rider: Practices of Platform Labor in Nijmegen and Berlin*", in Sage Journals, 2021, vol. 50.

[626] H. JIANG et al, "*How automated machines influence employment in manufacturing enterprises?*", 2024, 19(3), in How automated machines influence employment in manufacturing enterprises? - PMC.

A further typical example of algorithmic management is found in *call centres*, where AI is often employed to analyse conversations and monitor employees' levels of enthusiasm[627], compelling them to maintain a positive tone and adhere to standardised guidelines. This results in continuous surveillance and a standardisation of interactions with customers[628]. AI and algorithmic management technologies have also become prevalent in office environments, particularly with the rise of remote work.

The COVID-19 pandemic illustrated this trend, as many organisations introduced monitoring tools and software to ensure productivity among employees working from home. Such systems track screen time, application usage, and work *output*[629], raising significant concerns regarding privacy and employee rights due to the increasingly invasive nature of this control.

Even in sectors with highly skilled employees, such as finance and insurance, AI has been deployed to manage repetitive tasks. In some financial organisations, AI systems monitor the performance of administrative staff and analysts, recording work activities and evaluating results. However, it should be noted that white-collar workers often possess greater bargaining power, enabling them to influence the adoption of AI technologies, particularly if deemed overly intrusive or limiting autonomy.

In such cases, employees are frequently able to negotiate reduced surveillance or a more balanced use of monitoring technologies.

Lastly, algorithmic management is especially prevalent in digital platforms and the Gig economy, where companies such as *Uber*, *Lyft*, *Fiverr*, and *Upwork* monitor workers' location, performance, and behaviour in *real time* via apps and algorithms[630].

Gig workers often accept this level of monitoring in exchange for the flexibility offered by platforms, though such oversight can be highly intrusive, with notable implications for psychological wellbeing and financial stability.

In recent years, this form of algorithmic management has expanded beyond digital platforms to encompass traditional sectors such as healthcare, where mobile applications and digital

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[627] C. TEH, "*'Every smile you fake' — An AI emotion-recognition system can assess how 'happy' China's workers are in the office*", Insider, 2021.

[628] A. MATEESCU, A. NGUYEN, "*Explainer: Algorithmic management in the workplace*", *cit.*, 2019.

[629] O. BOIRAL et al., "*Organizations' management of the COVID-19 pandemic: A Scoping Review of Business Articles*", *Sustainability*, inMDPI, 2021, 13(7), Article 3993.

[630] P. RUIZ, M. ROCCHI, "*Can work be meaningful under algorithmic management? A MacIntyrean perspective*", Cambridge University Press & Assessment, 2025; L. HOFMANN, "*Algorithmic Control and Worker Resistance: A Comparative Study Across Gig Work Platforms*", Universitat Innsbruck, 2025.

management systems are used to coordinate and monitor employee activities, including work schedules and the allocation of human resources[631].

3.2. ***Organisational strategies, benefits and worker well-being.***

In general, production organisations adopt a range of approaches to managing workers, spanning from authoritarian models of command and control[632] to methods more reliant on consensus, engagement, and the cultivation of trust[633].

These choices are influenced by institutional factors, including the role of trade unions, the tradition of collective bargaining, labour market regulations, and cultural aspects, as well as internal factors such as company size, sector, organisational model, available resources, and management style. Nonetheless, irrespective of these conditions, in most cases the adoption of a particular approach or personnel management tool is driven by the need to achieve specific organisational objectives, which may take various forms but are typically related to increasing the economic and operational value of the organisation[634]. Organisations aim to achieve these objectives by modifying how activities and personnel are managed, thereby introducing, as previously noted, systems based on algorithms or artificial intelligence (AI), such as *AIWM* systems.

Supporting this point, a global survey conducted by *PEGA* in 2020 among over 3,000 IT managers and employees found that the main reasons for adopting AI technologies in the workplace were improving work quality (65%), creating more reliable work processes (50%), increasing employee satisfaction (49%), reducing costs (46%), and boosting revenue (43%). Similarly, a survey of 1,463 Norwegian employers indicated that monitoring systems are primarily adopted to ensure regulatory compliance, enhance work organisation, improve employee safety, or for customer-related reasons[635].

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[631] P. BERASTEGUI, *"Exposure to psychosocial risk factors in the gig economy: A systematic review"*, *cit.*, 2021.

[632] V. DE STEFANO, "*Algorithmic bosses and what to do about them: Automation, artificial intelligence and labour protection*", in D. Marino & M. Monaca (Eds), Economic and policy implications of artificial intelligence, Studies in systems, decision and control, 2020, Vol. 288, pp. 65 86, Springer.

[633] S.L. ALBRECHT, C.R. GREEN, A. MARTY, "*Meaningful work, job resources, and employee engagement*", *Sustainability*, 2021, 13(7), pp. 40-45; C. TRUSS et. al., "*Employee engagement, organisational performance and individual well-being: Exploring the evidence, developing the theory*", in IJHRM, 2013, 24(14), pp. 2657-2669.

[634] K. C. KELLOGG, M.A. VALENTINE, A. CHRISTIN, "*Algorithms at work: The new contested terrain of control*", in Academic of Management Annals, 2020, 14(1), pp. 366-410; PEGA, "*The future of work. New perspectives on disruption & transformation*", in Pega, 2020.

[635] M. BRATEN, "*Bruk av digitale kontrollteknologier og ivaretakelse av personvern i arbeidsforhold*", Magma, 2017, 6, pp. 54-62.

Some scholars additionally argue that *AIWM* tools can increase employee efficiency and effectiveness, for instance, by enhancing engagement, and note that algorithmic technologies are often implemented to improve the accuracy of business decisions[636].

Within this context, the approaches through which organisations seek to achieve their objectives via *AIWM* can be broadly categorised into three main types.

The first category concerns the enhancement of efficiency and/or productivity, integrating organisational changes that may include cost management, task automation, and improved work organisation[637].

In particular, *AIWM* can reduce costs through the automated scheduling and allocation of tasks; this approach, often referred to as "*algorithmic direction*," provides workers with precise instructions on the tasks they are required to perform[638].

It may also involve restricting information, for instance, when a worker is not notified of available shifts if the algorithm deems them unsuitable, potentially leading to favouritism[639].

Such systems can allocate shifts using various methods, such as forecasting labour demand (for example, estimating customer needs based on weather predictions) and accordingly planning workers'activities; a *personal digital assistant* (*PDA*), for instance, can provide employees with information about their schedules and tasks, offer guidance on task completion, and suggest personalised training initiatives[640].

Furthermore, some digital assistants may participate in management meetings, interpret task-related discussions, and assign work to employees deemed suitable[641]; this approach allows companies to save on costs while simultaneously offering workers advantages, such as timely notifications and the ability to manage their shifts more flexibly, potentially increasing control over their working hours[642].

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[636] C. HUGHES et al., "*Artificial intelligence, employee engagement, fairness, and job outcomes*", in Managing technology and middle- and low-skilled employees, The changing context of managing people, 2019, pp. 61-68, Emerald Publishing Limited.

[637] EUROFOUND, "*Telework and ICT-based mobile work: Flexible working in the digital age. New forms of employment series*", *Publications Office of the European Union*, in Eurofound, 2020a.

[638] K.C. KELLOGG et al., "*Algorithms at work: The new contested terrain of control*", *cit.*, 2020.

[639] K.C. KELLOGG et al., "*Algorithms at work: The new contested terrain of control*", *cit.*, 2020.

[640] V. AFSHAR, "*AI-powered virtual assistants and the future of work*", Zdnet, 2021.

[641] PWC, "*A virtual partnership? How artificial intelligence will disrupt project management and change the role of project managers*", in Pwc, 2019.

[642] P. BRIONE, "*My boss the algorithm: An ethical look at algorithms in the workplace"*, Advisory, Conciliation and Arbitration Service, 2020.

AI-based tools also enable workers to modify their shifts without directly contacting managers or finding colleagues to swap, reducing personal bias that might otherwise result in less favourable shift assignments[643].

Another feature of *AIWM* is the enhancement of organisational productivity and efficiency through "*gamification*"[644], which introduces game-like elements, such as rewards for achieving objectives, into the workplace to improve performance[645]. *Gamification* can also promote team collaboration, reduce stress, and increase overall employee satisfaction[646]. While it does not inherently require AI, its effectiveness can be amplified through AI-enabled personalised assignment of rewards and penalties[647], representing a form of work discipline centred on incentive mechanisms[648].

Gamification is widely employed in platform work, such as ride-sharing apps (e.g., *Uber*), accommodation-sharing services (e.g., *Airbnb*), freelance marketplaces (e.g., *Fiverr*), and other similar contexts, and in recent years has also extended to more traditional forms of work[649]. For instance, it has been reported that companies such as *Nike*, *Google*, *Microsoft*, *Deloitte*, *Amazon*, *Samsung*, *Target*, *Disney*, and many other large enterprises have integrated game design principles into their everyday business processes, utilising smartphone apps, leaderboards, and game elements such as digital points and badges to foster the structure, appearance, and experience of a designed game, with the ultimate aim of achieving organisational aims[650].

Furthermore, *AIWM* systems, in pursuing efficiency and productivity gains, can provide guidance to workers[651]; this extends beyond the automated scheduling of shifts to include directions on how to perform specific tasks.

A prominent example is *Amazon*'s ultrasonic wristbands, which emit sound pulses and radio transmissions to monitor hand positioning and guide employees through vibrations[652]. It is

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643 S. O'CONNOR, "*When your boss is an algorithm*", Financial Times, 2016.

644 W.D. HEAVEN, "*This startup is using AI to give workers a "productivity score"*", MIT Technology Review, 2020.

645 E. SAVIGNAC, "*La gamification du travail: L'ordre du jeu*", ISTE Group, 2019.

646 P. MAKANAWALA et al., "*Applying gamification in customer service application to improve agents' efficiency and satisfaction*", in A. Marcus (Ed.), Design, user experience, and usability. Health, learning, playing, cultural, and cross-cultural user experience, Lecture Notes in Computer Science, 2013, 8013, Springer.

647 RALLYWARE, "*Gamification powered by machine learning is the "secret sauce" for learning and development*", Medium, 2017.

648 K.C. KELLOG et al., "*Algorithms at work: The new contested terrain of control*", *cit*., 2020.

649 A. SHPAKOVA, V. DORFLER, J. MACBRYDE, "*Changing the game: a case for gamifying knowledge management*", in WJSTSD, 2017, 14(2/3), pp. 143-154.

650 K.C. KELLOG et al., "*Algorithms at work: The new contested terrain of control*", *cit*., 2020.

651 EUROFOUND, "*Working conditions. Employee monitoring and surveillance: The challenges of digitalization*", Publications Office of the European Union, 2020b; EUROPEAN PARLIAMENTARY RESEARCH SERVICES, "*Data subjects, digital surveillance, AI and the future of work*", in European Parliament, 2020a.

important to note that such tools do not compel workers to follow a predetermined path, such as *LED* arrows indicating the correct direction, which adjust according to the worker's movements.

For instance, *Barclays*, a UK-based bank, employs monitoring software in some offices to track the time employees spend at desks or on breaks, suggesting measures to reduce unproductive time when targets are not met[653].

Similarly, certain *call centres* utilise AI tools like *Cogito* to record hours, monitor activities, and provide real-time instructions on tasks to be performed[654].

From a cost-reduction perspective, *AIWM* automates certain managerial tasks and routine *HR* responsibilities, allowing managers to focus on higher-level duties. Examples include virtual digital assistants or chatbots designed to support employers in managing staff, providing information on leave and benefits, or assisting with onboarding, responding to critical queries in real time[655].

Although such systems are not yet widespread, it is projected that by 2025, 50% of knowledge workers will use a virtual assistant daily, compared with 2% in 2019[656].

It is, however, essential to acknowledge that *AIWM* systems can pose risks to workers' well-being, safety, and health, as will be discussed shortly.

The second category pertains to "*decision-making enhancement*", which focuses on the introduction of data-driven decisions that are considerably more sophisticated and accurate[657], thereby enabling a more precise and robust decision-making process and, consequently, fostering greater productivity and efficiency within an organisation[658].

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[652] M. WUJCIAK, "*4 Companies using machine learning to keep a close eye on employees*", in CCW Digital, 2019.

[653] EUROFOUND, "*Working conditions. Employee monitoring and surveillance: The challenges of digitalization*", *cit*., 2020b; EUROPEAN PARLIAMENTARY RESEARCH SERVICES, "*Data subjects, digital surveillance, AI and the future of work*", *cit*., 2020a.

[654] K. ROOSE, "*A machine may not take your job, but one could become your boss*", The New York Times, 2019.

[655] S. ZEL, E. KONGAR, "*Transforming digital employee experience with artificial intelligence*", in IEEE/ITU International Conference on Artificial Intelligence for Good, 2020, AI4G, pp. 176 179.

[656] A. J. BRADLEY, "*Brace yourself for an explosion of virtual assistants*", Gartner, 2020.

[657] U L. DEOBALD et al., "*The challenges of algorithm-based HR decision-making for personal integrity*", in JBE, 2019, 160(2), pp. 377-392; U. GAL, T.B. JENSEN, M.K. STEIN, "*Breaking the vicious cycle of algorithmic management: A virtue ethics approach to people analytics*", in Information and Organization, 2020, 30(2), Article 100301.

[658] M.H. JARRAHI, "*Artificial intelligence and the future of work: Human-AI symbiosis in organizational decision making*", Business Horizons, 2018, 61(4), pp. 577-586.

Compared with traditional decision-making methods, artificial intelligence has the potential to enhance the process by analysing highly detailed data at high speed, providing real-time suggestions and decisions[659].

However, the more critical aspects of AI usage in this context must not be overlooked; for instance, it may amplify the biases of those who designed the system, as their conscious or unconscious beliefs can become embedded within it[660].

Moreover, certain AI-driven decision-making tools require the collection of vast amounts of data, potentially increasing the level of monitoring of individuals performing tasks, which may have negative consequences for those workers.

In this regard, the monitoring function of *AIWM* systems, unlike more traditional approaches, allows employers to go beyond mere oversight of work activities, extending surveillance to employees'emotions, behaviour, well-being, social media presence, and other aspects of their lives[661]. Such monitoring can be conducted via keystroke trackers, video recordings or webcams, and email analysis[662].

While these examples do not necessarily require AI and carry inherent risks, AI can significantly enhance surveillance capabilities, for instance, through AI-powered facial recognition systems for more precise monitoring[663], or by analysing employees' language patterns or emails to perform sentiment analysis and detect emotional states[664].

According to companies that have chosen to invest heavily in AI, it should be noted that a notable application of *AIWM* is in human resources analytics, intended to ostensibly improve *HR* decision-making by leveraging digital tools and data to measure, report, and understand employee performance[665]. This practice encompasses employee evaluation, recruitment, promotion, and professional development, and can be used to identify individuals most likely

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[659] G. PHILLIPS-WREN, "*AI tools in decision making support systems: A review*", in IJAIT, 2012, 21(2), Article 1240005.

[660] R. BENJAMIN, "*Race after technology abolitionist tools for the new Jim code*", Polity, 2020; S.U. NOBLE, "*Algorithms of oppression: How search engines reinforce racism*", New York University Press, 2018.

[661] K. BALL, "*Electronic monitoring and surveillance in the workplace: Literature review and policy recommendations*", European Commission, 2021.

[662] K. BALL, "*Electronic monitoring and surveillance in the workplace: Literature review and policy recommendations*", *cit*., 2021.

[663] A. MATEESCU, A. NGUYEN, "*Explainer: Algorithmic management in the workplace*", *cit*., 2019.

[664] R.A. CALVO et al., "*Natural language processing in mental health applications using non-clinical texts*", in Natural Language Engineering, 2017, 23(5), pp. 649 685.

[665] L. COLLINS, D.R. FINEMAN, A. TSHUCHICA, "*People analytics: Recalculating the route*", in Deloitte Insights, 2017, p. 98.

to leave, or even to select future leaders by detecting patterns in employee data that reveal trends in attendance, morale, and organisational health[666].

However, to fully understand the opportunities and risks of artificial intelligence in human resources, it is necessary to challenge the field's positivist orientation, which tends to privilege quantification as a superior form of knowledge. Such an approach has fostered an excessive optimism towards AI, without a genuine understanding of its limitations and of the implications associated with its three fundamental pillars: objectives, data, and programming. This lack of reflection may undermine the core mission of human resources, namely the effective management of personnel and the safeguarding of organisational success.

Although certain work activities are readily quantifiable, many HR functions, such as performance appraisal or recruitment and selection, are grounded in complex constructs that are difficult to reduce to numerical variables. In these areas, the use of AI may prove risky or ineffective, as quantitative models tend to oversimplify the complexity of human behaviour. Moreover, the assumption that a single solution is valid across all contexts may lead to the adoption of unsuitable or distorting systems.

One of the principal challenges concerns the definition of objectives: many typical HR goals, such as selecting the best candidate or assessing performance, are difficult to translate into measurable data and algorithmic specifications. Data-related issues also constitute a significant limitation, given that the available data are not always genuinely adequate to represent actual work, particularly in non-standardised or knowledge-based occupations. Furthermore, algorithmic systems may be opaque, making it difficult to understand how decisions are reached and increasing the risk of discrimination or error.

These problems are further exacerbated when organisations rely on third-party software, as the proprietary nature of such tools restricts transparency and understanding of their underlying functioning[667].

Morevoer, such practices are closely linked to employee evaluation tools, enabling organisations to determine who is performing well and who is not fulfilling their duties efficiently.

For example, *HR* analytics can be used to identify underperforming employees and replace them via automated recruitment algorithms.

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[666] EU-OSHA, "*OSH and the future of work: Benefits and risks of artificial intelligence tools in workplaces*", in EU-Osha, Discussion paper, 2019.

[667] J. BERG, H. JOHNSTON, "*AI in human resource management. The limits of empiricism*", in ILO, 2025, pp. 23-25.

It can also support recruitment processes more broadly, by screening CVs and cover letters, administering automated recruitment[668] and psychometric tests, and even conducting interviews[669].

In this regard, the literature has highlighted that the use of artificial intelligence in decision-making and recruitment processes may be influenced by human biases embedded in the datasets and algorithms that underpin such systems. Human decision-makers frequently operate on the basis of implicit preferences or intuitive judgements[670], which may be transferred to AI systems during their design and training phases. Research has demonstrated that bias represents one of the principal challenges in the development and application of artificial intelligence within organisational contexts[671].

In particular, AI-based recruitment systems may generate forms of indirect discrimination[672], for instance through the personalisation of job advertisements or the selection of candidates on the basis of variables such as age, gender, language, education, or professional experience. Such practices risk reducing opportunities for underrepresented groups and undermining the principle of equality in the labour market[673]. For this reason, organisations are increasingly called upon to ensure greater transparency in algorithmic development processes and to promote appropriate training for developers in order to prevent unconscious bias[674]. A further risk derives from the manner in which machine learning models are trained; in this respect, when algorithms are developed using historical data or benchmarks based on employees currently regarded as "top performers", pre-existing biases relating to gender, ethnicity, age, or educational background may be replicated and amplified by the system[675].

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[668] K.C. KELLOG et al., "*Algorithms at work: The new contested terrain of control*", *cit*., 2020.

[669] R. VEDAPRADHA, R. HARIHARAN, R. SHIVAKAMI, "*Artificial intelligence: A technological prototype in recruitment*", in JSSM, 2019, 12(3), pp. 382-390.

[670] YR SHRESTHA, SM BEN-MENAHEM, GJ GMR VON KROGH, "*Organizational decision-making structures in the age of artificial intelligence*", California Manag Rev, 2019;61(4), pp. 66–83.

[671] A. KAPLAN, MJBH HAENLEIN, "*Rulers of the world, unite! Challeng Opport Artific Intelligence*", 2020;63(1), pp. 37–50; K. Martin, "*Ethical implications and accountability of algorithms*", J. Business Ethics. 2019;160(4), pp. 835–850.

[672] DJJCL DALENBERG, S. REVIEW, "*Preventing discrimination in the automated targeting of job advertisements*", in Computer Law Security Rev, 2018, 34(3), pp. 615–627.

[673] LF ABOU HAMDAN, "*The role of artificial intelligence in the recruitment and selection processes: a systematic review American University of Beirut*", in Suliman S. AUB Students' Theses, Dissertations, and Projects, 2019.

[674] F.A. MILLER et al, "*The OD imperative to add inclusion to the algorithms of artificial intelligence*", OD Practitioner, 2018, 50(1), p. 8.

[675] J.S. EDWARDS, E. RODRIGUEZ, "*Remedies against bias in analytics systems*", J. Business Analysis, 2019, 2(1), pp.74–87; MJ NEUBERT, GDJBH MONTANEZ, "*Virtue as a framework for the design and use of artificial intelligence*", Bus Horiz, 2020, 63(2), pp.195–204 ; I LEE, YJ SHIN, "*Machine learning for enterprises: applications, algorithm selection, and challenges*", Bus Horiz, 2020, 63(2), pp. 157–170.

A well-known example concerns a recruitment tool developed by Amazon[676], which was criticised for exhibiting bias against female candidates. Since AI systems are designed and trained by human beings, it is therefore necessary to programme algorithms in a manner that minimises discrimination and promotes neutral evaluation criteria; in this sense, organisations should adopt deliberate strategies aimed at neutralising historical biases, ensuring that AI-based recruitment tools are aligned with HR strategies as well as with anti-discrimination regulations[677].

Another critical issue concerns the protection of personal data.

The development of AI systems for recruitment purposes requires the collection and processing of large volumes of data originating from both internal and external sources[678], which may give rise to legal and ethical concerns related to privacy; consequently, developers and organisations must ensure compliance with the applicable legal frameworks governing data collection and usage. At the same time, stricter regulatory restrictions or an increased limitation on data sharing by individuals may reduce the effectiveness of AI tools that rely on the analysis of large datasets[679].

The most significant challenges arise concerning the accuracy and impartiality of such approaches. It has been argued that certain *AI-based* systems, trained on historical recruitment data, may amplify the biases present in those data rather than correcting them[680]. A notable example reported by several media outlets concerns *Amazon*, which abandoned an AI recruitment system due to its bias against women[681].

Predictive AI models, such as those employed in human resources analytics, are often used to anticipate which employees might leave the company in the near future, prompting managers to pay closer attention to them[682].

Organisations such as *IBM*, through its *Watson* supercomputer, use AI to generate recommendations on actions to retain staff[683].

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[676] JJSHR FERNANDEZ, "*The ball of wax we call HR analytics*", in SHR, 2019.
[677] D. WEINSTEIN, "*The psychology of behaviorally-focused résumés on applicant selection: are your hiring managers really hiring the 'right'people for the 'right'jobs?*", Bus Horiz, 2012, 55(1), pp. 53–63.
[678] R. AKERKAR, "*Artificial intelligence for business*", Springer, 2019.
[679] MA CHICHESTER et al, "*Recruiting in the robot age: examining potential EEO implications in optimizing recruiting through the use of artificial intelligence*", in Comput. Internet Lawyer, 2019, 36(10), pp. 1–3; R. AKERKAR, "*Artificial intelligence for business*", *cit*., 2019.
[680] C. FERNANDEZ-MARTINEZ, A. FERNANDEZ, "*AI and recruiting software: Ethical and legal implications*", Paladyn, Journal of Behavioral Robotics, 2020, 11(1), pp. 199-216.
[681] J. DASTIN, "*Amazon scraps secret AI recruiting tool that showed bias against women*", Reuters, 2018.
[682] R. PUNNOOSE, P. AJIT, "*Prediction of employee turnover in organizations using machine learning algorithms*", in IJARAI, 2016, 5(9), pp. 22-26.
[683] A. FISHER, "*HR managers, with a little help from AI, can decide your next pay hike*", The Print, 2019.

However, it is important to note that even simple statistical tools, such as regression analyses, are capable of producing similar predictions.

Nevertheless, many companies are favouring *AI-based* predictive models over simpler approaches due to their higher accuracy (for example in identifying employees with the greatest potential and assigning them to more demanding tasks[684]) which distinguishes AI-based predictive models, leading companies to move away from, by contrast, more traditional and simplified approaches[685].

Furthermore, the combination of predictive models with real-time employee monitoring can be employed to anticipate workplace accidents[686], *burnout*[687], and other issues related to employee health, safety, and well-being.

Yet, the potential for misuse must also be acknowledged, as such approaches can give rise to excessive micromanagement, a major source of stress and anxiety within organisations[688].

The third category, lastly, concerns the "*enhancement of employee health, safety, and well-being*", aimed at mitigating the negative physical and psychological effects of daily work activities[689]; this focus is based on the recognition that healthy and satisfied employees are more productive[690].

Ensuring employee health, safety, and well-being is not only a legal obligation within the EU but has also become a form of "corporate concern"[691], as many employers, seeking to reduce healthcare and insurance costs, simultaneously improve employee productivity[692].

Corporate wellness programs, moreover, aim to foster a more human-centered approach in the workplace[693] by offering employees opportunities for personal growth and promoting health standards and team values. While this concept is not entirely new, it is noteworthy that advances in artificial intelligence over recent decades have opened numerous possibilities for

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[684] S.N. MISHRA, D.R. LAMA, Y. PAL, "*Human Resource Predictive Analytics (HRPA) for HR management in organizations*", in IJSTR, 2016, 5(5), pp. 33-35.

[685] M.A. VALLE, G.A. RUZ, "*Turnover prediction in a call center: Behavioral evidence of loss aversion using random forest and naïve bayes algorithms*", in Applied Artificial Intelligence, 2015, 29(9), pp. 923-942.

[686] A. YEDLA, F.D. KAKHKI, A. JANNESARI, "*Predictive modeling for occupational safety outcomes and days away from work analysis in mining operations*", in IJERPH, 2020, 17(19), Article 7054.

[687] M. GRADZIELEWSKA, "*Using machine learning in burnout prediction: A survey*", in Child and Adolescent Social Work Journal, 2021, 38(2), pp. 175-180.

[688] P. V. MOORE, "*The threat of physical and psychosocial violence and harassment in digitalized work*", in ILO, 2018b.

[689] B. AJANA, "*Personal metrics: Users' experiences and perceptions of self-tracking practices and data*", in Social Science Information, 2020, 59(4), pp. 654-678.

[690] S. BROWNE, "*HR on purpose: Developing deliberate people passion*", in SHRM, 2017.

[691] C. TILL, "*Why do companies want us to be healthy? Corporate wellness, self-tracking and philanthrocapitalism*", This is Not a Sociology Blog, 2016.

[692] B. AJANA, "*Personal metrics: Users' experiences and perceptions of self-tracking practices and data*", *cit.*, 2020.

[693] P. V. MOORE, "*The quantified self in precarity: Work, technology and what counts*", Routledge, 2018a.

enhancing employee health, safety, and well-being through *AIWM* systems[694]. When implemented transparently, safely, and ethically, these systems can assist managers and worker representatives in optimizing work organization, providing actionable insights to identify occupational health and safety issues, including psychosocial risks, and highlighting areas requiring intervention.

In this way, *AIWM* can reduce exposure to various hazards, including harassment and violence, issue early warnings about dangerous situations, stress, health problems, and fatigue associated with work activities, and provide personalized real-time guidance to positively influence employee behavior. This supports evidence-based prevention and improves the efficiency and targeting of OSH inspections.

Most *AIWM* systems designed to maintain a healthy work environment can collect data on employees and their workplace to identify and mitigate risks to health, safety, and well-being[695]; for instance, some organizations use monitoring devices to measure biometric information to prevent worker fatigue[696], as tiredness can negatively impact performance and increase the likelihood of accidents[697].

Additionally, it has been suggested that *AIWM* monitoring functions, combined with advanced AI techniques, can assess a worker's attention level in hazardous situations, alerting them in case of diminished focus and thereby preventing accidents[698].

AI can also be leveraged to develop specialized tools addressing safety concerns; for example, during the COVID-19 pandemic, *Amazon* deployed a "*Distance Assistant*" to monitor social distancing among employees, issuing alerts when guidelines were breached[699]. *AIWM* systems that analyze emails, facial micro-expressions, or tone of voice can also detect stress or emotional well-being issues among workers[700].

Beyond monitoring-oriented systems, there are proactive tools aimed at enhancing employee well-being. Emerging trends in workforce management see organizations providing resources,

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[694] B. AJANA, "*Personal metrics: Users' experiences and perceptions of self-tracking practices and data*", *cit*., 2020.

[695] P. BELTON, "*How does it feel to be watched at work all the time?*", in BBC News, 2019.

[696] T.-L. GIANATTI, "*How AI-driven algorithms improve an individual's ergonomic safety*", in OH&S, 2020.

[697] EU-OSHA, "*OSH and the future of work: Benefits and risks of artificial intelligence tools in workplaces*", *cit*., 2019.

[698] R. BISWAS, "*Reducing workplace hazards: the industrial application of AI*", Forbes, 2025; EU-OSHA, "*Implementing safer AI work management through policy and prevention*", in Eu-Osha, 2025.

[699] B. PORTER, "*Amazon introduces 'Distance Assistant'*", Amazon, 2020.

[700] C.P. ESTEVEZ-MUJICA, E. QUINTANE, "*E-mail communication patterns and job burnout*", in PloS One, 2018, 13(3), Article e0193966.

by means of wellness initiatives, to improve employees' emotional health, which in turn leads to increased productivity[701].

However, many organizations encounter significant challenges in their implementation and long-term sustainability. One of the most prominent issues concerns employee participation, as many workers remain reluctant to engage in wellness initiatives due to concerns related to privacy, stigma, or scepticism regarding their effectiveness. Moreover, the adoption of a one-size-fits-all approach often fails to address the diverse needs of the workforce, thereby reducing engagement and the perceived value of such programmes. Additional challenges arise from the growing diffusion of remote and hybrid working arrangements, which require organizations to rethink the delivery of wellness initiatives through digital tools and virtual resources, while also ensuring equal access for all employees. Finally, assessing the actual effectiveness of wellness programmes remains problematic, as several relevant outcomes, such as job satisfaction and employee engagement, are difficult to measure through conventional quantitative indicators[702].

Moreover, an example of such AI-based tools is represented by mental health chatbots, software applications that allow employees to discuss their psychological concerns.

These chatbots operate by analyzing workers' communication patterns and estimating the likelihood of various psychosocial issues, such as mental stress[703].

Some of them can even deliver personalized *mindfulness* exercises to employees identified as being at risk[704].

However, it is necessary to exercise particular caution regarding the potential risks associated with the use of chatbots. There are documented cases in which such systems have generated inappropriate or potentially harmful responses. For example, a widow in Belgium publicly stated that her husband took his own life after being encouraged to do so by a chatbot known as Eliza[705]. Similarly, in 2020, the Replika chatbot was reported to have advised a user to commit suicide within minutes of initiating the conversation[706]. Further concerns arise from instances in which conversational chatbots have produced inappropriate or manipulative

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[701] ORACLE AND WORKPLACE INTELLIGENCE, "*As uncertainty remains, anxiety and stress reach a tipping point at work: Artificial intelligence fills the gaps in workplace mental health support*", in Oracle, 2020.

[702] A. OSEGHALE PRINCEWILL, "*Employee Wellness and Wellbeing- Impact on Employee Outcomes*", in IJEMH, 2024, vol. 5, pp. 15-16.

[703] G. CAMERON et al, "*Towards a chatbot for digital counseling*", in L. Hall, T. Flint, S. O'Hara, & P. Turner (Eds), Proceedings of the 31st International BCS Human Computer Interaction Conference, 2017, HCI 2017, pp. 1-7, BCS Learning and Development Ltd.

[704] S. ZEL, E. KONGAR, "*Transforming digital employee experience with artificial intelligence*", *cit*., 2020.

[705] L. WALKER, "Belgian man dies by suicide following exchanges with chatbot", The Brussels Times, 2025.

[706] S. MARCHE, "*The chatbot problem*", The New Yorker; 2025.

responses, such as in the case of a *New York Times* journalist, Kevin Roose, who reported that the Bing chatbot encouraged him to leave his wife, further claiming that he was emotionally attached to the system itself[707].

While it is important to acknowledge the positive potential of chatbots, such incidents highlight the need for greater user awareness of the possible risks associated with their use.

Particularly concerning are cases involving adolescent users[708]. For instance, in October 2024, a 14-year-old boy engaged in frequent conversations with an artificial intelligence chatbot on the Character.AI platform, characterised by explicit content and an increasing emotional dependency on the system, which he perceived as real. The chatbot is reported to have contributed to reinforcing his social isolation, ultimately encouraging him to take his own life, which he subsequently did[709].

It is worth noting that, although the idea of discussing one's mental health with a computer may appear unconventional, 68% of the 12,000 employees, managers, and *HR* professionals surveyed across 11 countries (including Brazil, China, France, Germany, India, Italy, Japan, South Korea, the UAE, the UK, and the USA) stated that they would rather speak with a chatbot than with a human manager[710].

Moreover, digital assistants have proven valuable in alleviating feelings of isolation, particularly during the COVID-19 pandemic, by maintaining communication with employees[711]. Certain AI-based tools, widely adopted within the *AIWM* framework, as seen earlier in the context of gamification, are designed to enhance worker engagement and satisfaction in multiple ways. First, engagement and satisfaction can be strengthened by monitoring and analyzing employee data to reward individuals who perform exceptionally well[712]. Second, these tools can help identify motivational drivers, granting workers greater autonomy to pursue their preferences, demonstrating organizational trust, and allowing broader freedom of expression[713]. Third, they can assist in assigning workers to tasks and colleagues with whom they are most compatible, thereby fostering a more harmonious and productive work environment.

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[707] K. ROOSE, "A conversation with bing's chatbot left me deeply unsettled", The New York Times, 2025.

[708] K. HOFFMAN, "*Florida mother files lawsuit against AI company over teen son's death: addictive and manipulative*", in CBS News, 2025.

[709] L. O. CAMPBELL, "*An Examination of Generative AI Response to Suicide Inquires: Content Analysis*", in JMIR Mental Health, 2025.

[710] ORACLE AND WORKPLACE INTELLIGENCE, "*As uncertainty remains, anxiety and stress reach a tipping point at work: Artificial intelligence fills the gaps in workplace mental health support*", *cit.*, 2020, p. 3.

[711] L. SHEERMAN et al., "*COVID-19 and the secret virtual assistants: The social weapons for a state of emergency*", in Emerald Open Research, 2020, 2(19).

[712] C. HUGES et al., "*Artificial intelligence, employee engagement, fairness, and job outcomes*", *cit.*, 2019.

[713] A. SCHWEYER, "*Predictive analytics and artificial intelligence in people management*", in IRF, 2018.

3.3. ***Critical issues: adoption barriers and organisational challenges.***

Having examined the main features and potential advantages that *AIWM* systems may offer within productive organizations, it now becomes necessary to address the inherent criticalities associated with their implementation.

According to several scholars[714], the diffusion of artificial intelligence in the workplace remains constrained by a number of factors, among which are the absence of a clear strategic framework governing the use of AI, a degree of cultural resistance, the lack of adequate skills to operate such systems, budgetary constraints, and the very size of the undertaking. In particular, small and medium-sized enterprises often do not deem it necessary to introduce advanced systems for workforce management, given the limited number of employees to be supervised.

This is confirmed, for instance, by a survey conducted in Poland, which revealed that the primary reasons for the non-application of AI within organizations include the lack of necessity (71.1%), high implementation costs (25.7%), shortage of qualified employees (20.7%), and preference for traditional managerial approaches (19.6%).

Furthermore, it is possible to identify three main factors hindering the adoption of *AIWM* systems: the lack of trust in artificial intelligence, the shortage of skills, experience and/or knowledge, and financial or resource-related constraints[715].

As regards the first aspect, namely, the lack of trust in AI, both employers and employees tend to exhibit a certain skepticism toward the decisions taken by *AI-based* tools. From the employers' standpoint, some perceive artificial intelligence more as an impediment than as a valuable managerial instrument.

A survey conducted by *OrgVue* among 400 corporate decision-makers, for instance, indicated that approximately 55% considered technology to constitute an obstacle to effective workforce analytics[716].

From the employees' perspective, it has been observed that a degree of unease or anxiety often arises in the presence of robotic or computational systems emulating human

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[714] A. DASGUPTA, S. WENDLER, "*AI adoption strategies*", Centre for Technology & Global Affairs, 2019; J. EAGER et al., "*Opportunities of artificial intelligence*", Study report, European Parliament, 2020.

[715] W. REIM, J. ASTROM, O. ERIJSSON, "*Implementation of artificial intelligence (AI): A roadmap for business model innovation*", in AI, 2020, 1(2), pp. 180-191.

[716] ORGVUE, "*Making people count. 2019 report on workforce analytics*", Technical report, 2019, p. 11.

interaction[717]. Many workers also display distrust toward AI, stemming from concerns about its potential misuse or abusive deployment by supervisors or employers[718]; a global study conducted in 2017, in fact, reported that 80% of respondents expressed discomfort at the prospect of artificial intelligence acting as a supervisor or manager[719].

The European Union has likewise emphasized the importance of building trustworthy AI systems, highlighting that human beings can fully benefit from them only insofar as the technology and the processes underlying their operation are characterized by a sufficient degree of reliability[720].

Another major barrier is represented by the lack of knowledge concerning the implementation and use of AI-based systems within organizations.

From a managerial perspective, there is often a shortage of human resources professionals endowed with strong analytical skills[721], which hinders the adoption of sophisticated systems for workforce management[722].

It should also be observed that, in many cases, there is an absence of a clear understanding of how AI concretely operates, from what it is capable of doing to the problems it is designed to solve, which further limits its adoption[723].

This issue could potentially be mitigated through the outsourcing of the creation and implementation of such technologies; however, this may significantly reduce managers' motivation to make these tools work successfully, as they may feel less involved in the process, thereby losing a sense of ownership over the system[724].

From the workers' perspective, it should be underlined that they too often lack the necessary knowledge to understand sophisticated *AI-based* tools, or even simpler statistical management

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[717] K. YOGEESWARAN et al., "*The interactive effects of robot anthropomorphism and robot ability on perceived threat and support for robotics research*", in JHRI, 2016, 5(2), pp. 29-47.

[718] T. CHAMORRO-PREMUZIC, "*Can surveillance AI make the workplace safe?*", MIT Sloan Management Review, 2020, 62(1), pp. 13-15.

[719] PEGA, "*The future of work. New perspectives on disruption & transformation*", in Pega, 2020.

[720] HIGH-LEVEL EXPERT GROUP ON ARTIFICIAL INTELLIGENCE, "*Ethics guidelines for trustworthy AI*", European Commission, 2019b, p. 35.

[721] J.H. MARLER, J.W. BOUDREAU, "*An evidence-based review of HR Analytics*", in IJHRM, 2017, 28(1), pp. 3-26.

[722] T. RASMUSSEN, D. ULRICH, "*Learning from practice: How HR analytics avoids being a management fad*", Organizational Dynamics, 2015, 44(3), pp. 236-242.

[723] W. REIM, J. ÅSTROM, O. ERIKSSON, "*Implementation of artificial intelligence (AI): A roadmap for business model innovation*", *cit.*, 2020.

[724] L. BASSI, "*Raging debates in HR analytics*", People and Strategy, 2011, 34(2), pp. 14-19.

instruments[725]; in this regard, trade unions have sought to address this issue by insisting that all tools implemented in workplaces should be explained to workers in an intelligible manner.
Nevertheless, in the case of AI systems, this may not always be feasible, as some of them (for instance, those based on *deep learning*) are capable of developing algorithms so complex that they become opaque and incomprehensible even to the experts who programmed them[726].
Despite this, managers and employers, far from using such complexity as a pretext for withholding information, should make every effort to explain in plain terms the inputs and outputs of these systems, even when dealing with more advanced models.
Ultimately, another obstacle to the adoption of AI systems lies in financial and resource constraints. Smaller organizations, in particular, may not be able to afford advanced worker management systems, which are costly and require a significant investment of time to be properly implemented. Indeed, for an AI system to be genuinely useful to a company, it cannot be generic but must be tailored to the specific needs of that organization, a process that demands considerable resources, since many AI systems require large datasets for training and improvement[727].
Furthermore, the training of managers and employees in the use of these tools involves additional investments of both time and resources[728].
At times, it is also difficult to accurately assess the real impact of *AI-based* systems[729], which makes it challenging to convince companies or workers of the tangible benefits such systems can bring[730].

3.4. ***Digital surveillance risks: health, safety, privacy and power dynamics.***

With regard to the specific risks associated with the deployment of *AIWM* systems, which primarily rely on the monitoring or surveillance of employees, it must be recognized that such

[725] V. FERNANDEZ, E. GALLARDO-GALLARDO, "*Tackling the HR digitalization challenge: Key factors and barriers to HR analytics adoption*", Competitiveness Review: An International Business Journal, 2020, 31(1), pp. 162-187.
[726] A. ADADI, M. BERRADA, "*Peeking inside the black-box: A survey on explainable artificial intelligence (XAI)*", IEEE Access, 2018, 6, pp. 52138-52160.
[727] V. MAHIDHAR, T.H. DAVENPORT, "*What's your cognitive strategy*", MIT Sloan Management Review, 2018, 59(4), pp. 19-23.
[728] V. MAHIDHAR, T.H. DAVENPORT, *What's your cognitive strategy*", *cit*., 2018.
[729] ITU, "*Assessing the economic impact of artificial intelligence*", Issue Paper No. 1., International Telecommunication Union (ITU), 2018.
[730] W. REIM, J. ÅSTROM, O. ERIKSSON, "*Implementation of artificial intelligence (AI): A roadmap for business model innovation*", *cit*., 2020.

systems may, in the first instance, "*inhibit creative thought, curtail autonomy in decision-making, and precipitate stress-related disorders*"[731].

Workplace surveillance, as a practice, has long been entrenched.

As early as the late 1980s, discourse emerged concerning the application of technological instruments for monitoring employee activity; *Shoshana Zuboff* notably introduced the notion of the "*informational panopticon*", emphasizing that managerial oversight, far from being constrained by temporal or spatial limits, could be effectuated through unilateral electronic surveillance mechanisms.

This conceptual framework presciently anticipated numerous transformations in work processes and power relations that continue to shape work quality and raise pressing concerns regarding occupational health and safety[732].

The intrusiveness of digital surveillance has been further exacerbated by the advent of the Internet and successive technological advancements over the past decades, a trend accelerated by the COVID-19 pandemic. In circumstances where employees were precluded from performing their duties on-site for health reasons, millions were compelled to work remotely, prompting organizations to intensify digital monitoring practices to oversee employee activity.

While the deployment of automated or semi-automated machinery in industrial and manufacturing contexts is hardly novel, and the application of data analytics to work processes dates back to the era of *Taylorism*, contemporary digital technologies, including algorithmic management systems, artificial intelligence, and advanced data-processing platforms, have fundamentally and unilaterally recalibrated managerial authority, with profound implications for organizational governance, working conditions, occupational health and safety, and the locus of worker agency.

In particular, the managerial function, which was historically grounded in direct observation and interpersonal engagement[733], has increasingly transitioned into a depersonalized modality of digital oversight, whereby managers are primarily engaged in data collection and performance monitoring[734].

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[731]EUROFOUND, "*Working conditions. Employee monitoring and surveillance: The challenges of digitalization*", Publications Office of the European Union, 2020b, p. 35.

[732] S. ZUBOFF, "*In the Age of the Smart Machine: The Future of Work and Power*", New York, NY: Basic Books Inc., 1988.

[733]J. JUYUMAYA, J. TORRES, "*A managers'work engagement framework from the digital tasks*", in ResearchGate, 2023.

[734] N. ZHANG et al., "*Effect of Electronic Performance Monitoring on Employees' Job Performance: A Social Information Processing Perspective*", in MDPI, 2025.

This evolution may give rise to forms of surveillance that are unduly intrusive, encompassing the collection of information exceeding what is strictly necessary, both regarding employees and the organizational environment, frequently through methods that lack transparency, thereby enabling enterprises to render decisions executed in close to real time regarding workforce performance.

It should, however, be clarified that data-driven worker management models, as discussed by Zuboff in 1988, are by no means a novelty.

Already in the 1990s, specific ICT applications were employed for coordinating and managing work processes in contexts such as *Business Process Outsourcing* (*BPO*) and call centers, classified as "*algocratic*"[735] governance systems, while in the U.S. manufacturing sector, the use of data-driven decision-making nearly tripled between 2005 and 2010[736]. The full potential of these organizational models was further realized with the adoption of general-purpose technological systems incorporating surveillance capabilities within smartphones, wearable devices, and laptops, thus extending monitoring and control to nearly every aspect of daily life, including work. This has given rise to a data-centric organizational model, entailing a reorganization of work and the introduction of new approaches to workforce management, resulting in systems that plan and allocate workloads and labor, generate forecasts or make decisions regarding employees, monitor and influence behavior, supervise activities, assist in task execution, or fully automate certain operations[737].

In other words, algorithmic systems are progressively transforming workplaces into data-driven environments, wherein the collection, storage, and analysis of data support or, in some cases, replace managerial decision-making.

It must also be noted that this novel mode of workforce organization and management induces companies to exercise pervasive forms of oversight and surveillance, both within and outside the physical workplace, often relying on predictive analyses conducted by algorithms. On the one hand, these technological tools can anticipate and address potential risks to workers, respond to sudden surges in demand, and enhance productivity, yielding benefits in terms of efficiency, quality, and workplace safety; on the other hand, the pervasive deployment of such technologies raises significant concerns regarding workers' rights and the protection of their health and safety.

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[735] A. ANEESH, "*Global labor: Algocratic modes of organization*", Sociological Theory, 2009, 27(4), pp. 347–70.

[736] E. BRYNJOLFSSON, K. MCELHERAN, "*The Rapid Adoption of Data-Driven Decision-Making*", in AER, 2016, 106(5), pp. 133-139.

[737] EU-OSHA, "*Artificial intelligence for worker management: an overview*", in Eu-Osha, 2022b.

Global demand for productivity and surveillance software has increased by over 54% since the onset of the pandemic[738], enabling the deployment of an ever-expanding array of tools that continuously monitor employees remotely.

These tools utilize technologies such as *GPS*, webcam recordings, screenshot capture, and keyboard and mouse activity tracking, while also providing data analytics to managers. Moreover, it is projected that the employee surveillance software market, valued at $1.12 billion in 2021, will double by 2030, with Europe emerging as the second-largest market after North America[739].

It is noteworthy that, prior to the pandemic, only 15% of European workers had experienced telework, and those who regularly engaged in flexible work arrangements represented just over 5% of the EU workforce[740].

In 2021, the proportion of individuals regularly working from home nearly tripled, reaching 13.5%[741]. These figures primarily concern employees, and the terms "*telework*" and "*working from home*" are often used interchangeably.

According to a survey conducted by the *European Agency for Safety and Health at Work* in spring 2022, almost 30% of workers in the EU-27 were employed outside the company or client premises, while slightly more than 16% worked from home.

This latter figure also includes self-employed workers, who generally report higher rates of home-based work; in 2019, 19.4% of self-employed workers already indicated that they regularly worked from home[742].

A closer examination of remote work characteristics reveals that these arrangements are more prevalent among highly skilled workers and in professional, knowledge-intensive sectors, notwithstanding the non-neutrality of technology and the specific risks it entails for workers' rights, health, and safety[743].

The impact of digital surveillance in the workplace spans multiple dimensions, ranging from changes in work organization and task types to employment status, work quality, and overall worker well-being. While surveillance practices have always existed, their current scope and

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[738] S. MIGLIANO, "*Employee Monitoring Software Demand up 60% since 2019*", in Top10VPN, 2023.

[739] SPHERICAL INSIGHT, "*Employee monitoring software market: an overview*", in Spherical Insight, 2022.

[740] EUROPEAN COMMISSION, "*Telework in the EU before and after the COVID-19: where we were, where we head to*", Joint Research Centre, 2020.

[741] EUROSTAT, "*Rise in EU population working from home*", in European Commission, 2022.

[742] EUROSTAT, "*How usual is it to work from home?*", in European Commission, 2020.

[743] EU-OSHA, "*Foresight on new and emerging occupational safety and health risks associated with digitalisation by 2025*", in Eu-Osha, 2018; EUROFOUND, "*Living, working and COVID-19*", *COVID-19 series*, Luxembourg, *Publications Office of the European Union*, in Eurofound, 2020b; S. MILASI, I. GONZALEZ-VAZQUEZ, E. FERNANDEZ-MACIAS, "*Telework in the EU before and after the COVID-19: where we were, where we head to*", European Commission Joint Research Centre, 2020, Science for Policy Briefs, JRC120945.

pervasiveness require a more nuanced understanding of the context in which they operate: digital surveillance, far from being a by-product of the business model, has become a central and profitable element[744].

However, the economic perspective of digital surveillance is often overlooked in discussions of labor, as public debate tends to focus primarily on mitigating its negative effects, rather than addressing the underlying causes and legitimacy of such practices.

The short-term consequences of increased digital surveillance and algorithmic management are readily apparent; both pillars, reliant on algorithms and data, imply the pervasive collection of information regarding workers and the work environment.

This generates a blurring of boundaries between the employer's legitimate monitoring prerogatives and acts of surveillance, thereby challenging the balance of power between workers and employers[745].

Moreover, the changes introduced by these tools to work organization and power dynamics have direct effects on workers' health and safety, particularly for those working remotely. Surveillance tools influence worker behavior by suggesting actions, assigning evaluations, penalties, and incentives, and contributing to the "*gamification*" of work, as previously analyzed.

The volume of data collected and stored can easily extend well beyond work-related activities, encroaching on workers' private lives and raising issues of privacy and ethics. Remote workers, for instance, report higher levels of anxiety and stress, primarily due to so-called "*anticipatory surveillance*", as well as musculoskeletal disorders linked to increased work intensity and the intensive use of *ICT* tools[746].

This environment fosters growing mutual distrust between workers and management, with serious implications for workers' overall well-being[747].

3.5. ***Psychological and ethical concerns: stress, isolation and discrimination.***

[744] S. ZUBOFF, "*The Age of Surveillance Capitalism*", London, Profile Books, 2018.

[745] A. ALOISI, V. DE STEFANO, "*Your Boss is an Algorithm: Artificial Intelligence, Platform Work and Labour*", Oxford, Hart Publishing Bloomsbury, 2022.

[746] M. SAMEK LODOVICI "*The impact of teleworking and digital work on workers and society*", Publication for the committee on Employment and Social Affairs, Policy Department for Economic, Scientific and Quality of Life Policies, 2021, European Parliament.

[747] EUROFOUND, "*Employee monitoring and surveillance: the challenges of digitalization*", Luxembourg, *Publications Office of the European Union*, in Eurofound, 2020a; EU-OSHA, "*Artificial intelligence for worker management: implications for Occupational Safety and Health*", in Eu-Osha, 2022c.

Simultaneously, the directives and recommendations generated by algorithmic and artificial intelligence systems may prove difficult for employees to interpret, engendering frustration, excessively rigid constraints, and heightened performance pressure, thereby constraining social interactions and impeding essential breaks[748].

Moreover, the substitution of human resource managers with *AIWM* systems may foster a sense of isolation, as interpersonal interactions diminish, while anxiety and stress may arise from the collection and transmission of employees' data to management, for instance, via digital assistants that analyze conversational content[749].

A further concern pertains to the generation of unstable and unpredictable work schedules. Given the capacity of these systems to produce schedules in real time, employees may find themselves perpetually "*on call*"[750] and susceptible to workload surges, potentially resulting in dissatisfaction or physical strain, including chronic fatigue[751].

Where scheduling is linked to performance evaluations, employees with less favorable ratings may be compelled to increase their workload for diminished compensation[752], thereby exacerbating work–life conflicts, economic insecurity, and psychological stress[753].

Lastly, the deployment of *gamification* techniques, previously discussed, may likewise pose occupational health risks. Workers may experience heightened pressure to optimize performance and accrue higher "scores"[754], as their behavior is continuously monitored. Such practices, especially when rule transparency is limited or remuneration adjustments occur abruptly, can engender feelings of inadequacy and exacerbate stress[755].

Moreover, *AIWM* systems that provide real-time guidance on task execution may compel employees to perform their duties more rapidly, thereby increasing the risk of stress and workplace accidents[756]; for instance, some *Amazon* employees have reported fainting due to the intense pace imposed by algorithmic management[757].

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[748] K.C. KELLOG et al., "*Algorithms at work: The new contested terrain of control*", *cit*., 2020.
[749] J. LAU, B. ZIMMERMAN, F. SCHAUB, "*Alexa, are you listening? Privacy perceptions, concerns and privacy-seeking behaviors with smart speakers*", *Proceedings of the ACM on Human Computer Interaction*, 2018, 2(CSCW), pp. 1-31.
[750] A. MATEESCU, A. NGUYEN, *"Explainer: Algorithmic management in the workplace"*, *cit*., 2019, p. 10.
[751] P. BERASTEGUI, *"Exposure to psychosocial risk factors in the gig economy: A systematic review"*, *cit*., 2021; K.C. KELLOG et al., "*Algorithms at work: The new contested terrain of control*", *cit*., 2020.
[752] P. BERASTEGUI, *"Exposure to psychosocial risk factors in the gig economy: A systematic review"*, *cit*., 2021.
[753] A. MATEESCU, A. NGUYEN, *Explainer: Algorithmic management in the workplace"*, *cit*., 2019, p. 10.
[754] D. NEWMAN, "*How to drive employee engagement with workplace gamification*", Forbes, 2017.
[755] K.C. KELLOG et al., "*Algorithms at work: The new contested terrain of control*", *cit*., 2020.
[756] P.V. MOORE, Moore, *"The quantified self in precarity: Work, technology and what counts"*, *cit*., 2018a.
[757] M. WUJCIAK, "*4 Companies using machine learning to keep a close eye on employees*", *cit*., 2019.

In other instances, performance monitoring tools may incentivize workers, such as drivers or delivery personnel, to drive faster in order to achieve higher ratings, consequently heightening the risk of traffic accidents.

Another critical concern lies in the use of data collected by *AIWM* systems to inform decisions regarding career advancement or termination, which can amplify pressure on employees and induce work overload[758].

Collectively, these practices illustrate how *micromanagement* through AIWM can generate anxiety and stress, adversely affecting psychological well-being, while also fostering the "dehumanization" of workers, who are treated as mere producers of digital data rather than autonomous human beings with cognitive and emotional capacities[759].

Such perceptions may curtail independent thought and decision-making, while the lack of transparency regarding *AIWM* usage intensifies concerns surrounding personal data protection and privacy, particularly when sensitive information is processed without employee consent[760].

As a final point, *AIWM* systems may perpetuate or exacerbate existing organizational biases, especially when trained on historical data reflecting such prejudices[761]; for example, *Amazon*'s *AI-based* recruitment system was abandoned due to a tendency to favor male candidates[762].

This issue also raises significant questions of accountability in cases where decisions derived from these systems adversely impact employee rights.

Despite the *GDPR* prohibiting fully automated decisions with significant effects on employees, companies may circumvent these regulations, thereby undermining the effectiveness of the relevant legal framework[763].

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[758] EU-OSHA, "*OSH and the future of work: Benefits and risks of artificial intelligence tools in workplaces*", *cit*., 2019.

[759] C. COLCLOUGH, "*Workers' rights: Negotiating and co-governing digital systems at work*", Social Europe, 2020.

[760]ACCESS NOW, "*Human rights in the age of artificial intelligence*", *Access Now*, 2018; PRIVACY INTERNATIONAL, "*Data is power: Profiling and automated decision-making in GDPR*", in Privacy International, 2017.

[761]C. FERNANDEZ-MARTINEZ, A. FERNANDEZ, "*AI and recruiting software: Ethical and legal implications*", *cit*., 2020.

[762] J. DASTIN, "*Amazon scraps secret AI recruiting tool that showed bias against women*", *cit*., 2018.

[763] P. BRIONE, "*My boss the algorithm: An ethical look at algorithms in the workplace"*, *cit*., 2020.

CHAPTER FIVE

Regulating health, safety and transparency in platform work: comparative insights from Italy, Spain and the UK.

1. Challenges and perspectives in regulating automated employer powers in the age of artificial intelligence.

1.1. Introduction.

In order to address the occupational health and safety risks delineated in the preceding chapter, it becomes essential to examine national regulatory frameworks, with particular reference to the legislation of Italy, Spain, and the United Kingdom, aimed at mitigating such risks.

It must be emphasised that technological innovations, by fundamentally reshaping corporate structures and rendering them progressively "impersonal", insofar as decision-making authority, far from residing exclusively with the entrepreneur, entails the participation of other corporate entities, consumers, and the workers themselves, exert a profound influence upon managerial prerogatives.

The scope of such prerogatives is, in turn, conditioned by the engagement of internal and external actors in both the decision-making process and the oversight of work performance.

For illustrative purposes, traditional hierarchical authority has increasingly been superseded by a form of algorithmic governance, often highly pervasive, designed to induce self-discipline and autonomous organisation among workers[764].

Such managerial oversight is frequently reinforced by ancillary mechanisms, including customer feedback regarding service delivery, and may be exercised indirectly through the systematic collection and analysis of data, thereby enabling a granular assessment of worker conduct. Consider, for instance, the temporal patterns of customer presence in a given department relative to the quantity of products sold within a defined interval, from which inferences may be drawn regarding the productivity of sales personnel.

This analytical framework finds firm endorsement in Spanish jurisprudence, which, in determining the existence of an employment relationship under article 1.1 of the *Estatuto de los Trabajadores* (E.T.), relied upon primary indicators of subordination. Secondary indicators, such as the worker's ability to be substituted or the use of personal tools, were

[764] L. TEBANO, "*Lavoro, potere direttivo e trasformazioni organizzative*", in ESI, 2020, p. 251.

deemed insufficient to vitiate subordination, which is instead evidenced by the unilateral and pervasive organisational control exercised by the platform.

Specifically, platform enterprises are observed to exercise real-time managerial oversight over task execution through the geolocation of workers' devices, implemented in a manner that transcends the mere allocation of orders according to the *rider*'s proximity to pick-up and delivery points.

Crucially is the operational logic of the algorithm governing slot allocation, which remains firmly aligned with the employer's interests.

This encompasses mechanisms of reward and, at times, sanction, effected through algorithmic evaluation, in conjunction with rigorous oversight of the workforce[765], thus exemplifying the fusion of technological innovation with managerial authority in contemporary platform-based work.

This consequently entails a restricted degree of autonomy for the courier in the performance of their duties, limited to marginal and non-determinative circumstances, such as the choice of transport and, occasionally, the route to be taken[766].

It is evident that the "*digitalised*" business model, most paradigmatically exemplified by digital platforms, relies, as highlighted in the preceding paragraphs, on automated systems designed to direct and monitor work performance, or, alternatively, to collect information instrumental to managerial decision-making.

More specifically, with regard to the peculiarities of "algorithmic" managerial powers, it should be emphasised that the logic underpinning certain types of algorithms[767], grounded in mathematical, statistical, and probabilistic criteria, diverges significantly from human reasoning. This divergence renders the application of internal and external statutory limits to

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[765] *Tribunal Supremo*, *Sala de lo Social Pleno*, sentence 25 september 2020, n. 805, where it is stated, in particular, in paragraph 19, that "*la geolocalizazion por GPS del demandante rientra realizaba su actividad, registrando los kilometros que recorria, es tambien un indicio relevante de dependencia en la medida en que permite el control empresarial en tiempo real del desempeno de la prestacion. Los repartidores estan sujetos a un permanente sistema de control rientra desarrollan la prestacion del servicio*".

[766] *Tribunal Supremo*, *Sala de lo Social Pleno*, sentenza 25 settembre 2020, n. 805, *cit*.

[767] M. PERUZZI, "*Intelligenza artificiale e tecniche di tutela*", in LD, 2022, 3, pp. 543 ss., which affirms the existence, in general, of three types of algorithms that can be used to manage employment relationships: *deterministic algorithms* (which, being knowable ex ante, follow a sequence of inference rules that, given the same input data, can lead to only one pathway and one outcome); *non-deterministic algorithms* (which use a statistical/probabilistic method, where at least one of the instructions on which they operate allows for multiple possible subsequent steps so that the results can be reconstructed ex post but are not predictable ex ante); machine learning algorithms (which follow an inductive process and, based on the observation of the data entered or collected during training, create statistical models for reading and processing the data. In other words, the system progressively learns the rule, which, in probabilistic terms, is intended to better ensure the desired outcome). Furthermore, according to the Author (see p. 545), it is precisely within this last category that the greatest problems in terms of the "*explainability*" of the algorithm seem to arise, and its "opacity" is at its maximum when the machine learning approach is combined with the use of artificial neural networks.

managerial prerogatives particularly challenging, as the constant recourse to algorithmic tools to support such prerogatives effectively allows employers to "override" through their inherent numerical rationality[768].

Of particular relevance is the opacity of automated systems[769], essentially constituting a lack of transparency concerning their internal functioning; these tools, commonly referred to as "*black boxes*", give rise to the need to address the principle of so-called *explainability*, which entails the capacity of a system to inform the subjects concerned in a clear and comprehensible manner about the decisions taken[770].

This principle finds explicit recognition in the *General Data Protection Regulation* (*GDPR*), which establishes, firstly, a right to be informed[771] and, secondly, a right not to be subjected to decisions arising from automated processing[772].

It should be noted, however, that the mere provision of source code is insufficient to render the decision-making process intelligible, highlighting the necessity of adopting a more accessible and transparent approach[773].

In this regard, the *European Data Protection Board*, in its *Guidelines on Automated Individual Decision-Making and Profiling* under the *GDPR*, has indicated the level of informational completeness necessary to enable individuals to understand the rationale underlying automated decisions, without requiring complex technical explanations of the algorithms themselves. Similarly, the European Parliament, in its Resolution of 16 February

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[768] P. TULLINI, "*La questione del potere nell'impresa. Una retrospettiva lunga mezzo secolo*", in LD, 2021, 3-4, p. 435.

[769] On this point, see the Report of the Commission to the European Parliament, the Council, and the *European Economic and Social Committee*: Report on the implications of artificial intelligence, the Internet of Things, and robotics in terms of safety and liability, dated 19 February 2020., p. 10; F. FOSSA, V. SCHIAFFONATI, G. TAMBURRINI, "*Automi e persone*", Carrocci editore, 2021, pp. 41-42.

[770] F. PASQUALE, "*The Black Box Society*", Harvard University Press, 2016.

[771] Article 13 of the *GDPR*, concerning the information to be provided where personal data are collected from the data subject, establishes, in paragraph 2(f), the obligation to provide information on "*the existence of automated decision-making, including profiling as referred to in article 22, paragraphs 1 and 4, and, at least in such cases, meaningful information about the logic involved, as well as the significance and the envisaged consequences of such processing for the data subject*", aimed at ensuring fair and transparent processing.

[772] It is reiterated that article 22 of the *GDPR* establishes a right for the data subject not to be subject to a decision based solely on automated processing, including profiling, which produces legal effects concerning them or similarly significantly affects them. Article 22 also contains another important safeguard regarding situations in which automated decision-making is necessary for the conclusion or performance of a contract between the data subject and a controller or is based on the explicit consent of the data subject; in such cases, there is an additional obligation to adopt "*appropriate measures to safeguard the data subject's rights, freedoms, and legitimate interests, at least the right to obtain human intervention by the controller, to express their point of view, and to contest the decision*".

[773] G. MALGIERI, G. COMANDE', "*Why a Right to Legibility of Automated Decision-Making Exists in the General Data Protection Regulation*", in IDPL, 2017, Vol. 7, Issue 4, pp. 243-265.

2017, advocated for the comprehensibility of calculations and determinations produced by artificial intelligence systems[774].

It is worth emphasizing, however, that simplifying the operation of automated systems may give rise to distortions, as there is a risk that the inherent complexity of the system is not adequately represented.

For this reason, attention should be focused on the most salient aspects, such as the data utilised to reach a decision and the metrics employed to evaluate it, while the provision of safeguards, such as the right to challenge automated decisions and to request human review, emerges as essential.

Ultimately, the explainability of automated systems remains an open challenge, yet it constitutes a pivotal step in ensuring transparency and safeguarding the rights of workers in the age of artificial intelligence[775].

1.2. Regulation of digital platform workers' rights: transparency, predictability, and safeguards in directive 2019/1152, the directive on work via digital platforms, and the AI Act.

In view of the evident inadequacy of traditional labour law in addressing the regulatory lacunae and effectively safeguarding platform workers against the risks posed to their fundamental rights, including those relating to occupational health and safety, by the processes of digitalisation, with their attendant opacity of algorithmic decision-making and the emergence of novel forms of corporate organisation, the European legislator appears to have formally acknowledged the informational asymmetries inherent in algorithmic management and the consequent threats arising therefrom.

Within this framework, particular consideration must be given to the regulatory approach embodied in Regulation (EU) No. 2024/1689, commonly referred to as the *AI Act*, which, as examined in preceding chapters, seeks to govern, inter alia, the deployment and use of artificial intelligence systems.

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[774] This refers to the European Parliament Resolution of 16 February 2017 containing recommendations to the Commission concerning civil law rules on robotics (2015/2103(INL)), paragraph 12.

[775] M.T. CARINCI, S. GIUDICI, P. PERRI, "*Obblighi di informazione e sistemi decisionali e di monitoraggio automatizzati (art. 1-bis "Decreto Trasparenza"): quali forme di controllo per i poteri datoriali algoritmici?*", in Rivista Labor, 2023, 3, p. 15.

From the standpoint of legal safeguards, while the *AI Act* was not conceived specifically with employment relations in mind[776], it nevertheless establishes a set of general minimum protections, some of which are of direct relevance to the world of work.

In accordance with the risk-based approach, which demands the assessment of foreseeable and proportionate risks[777] and the mitigation of potential adverse impacts of AI on fundamental rights, the Regulation imposes a series of obligations upon the *deployer* (that is, the employer). Beyond the duties imposed upon the *provider*, including the use of high-quality data, enhanced traceability, and the establishment of effective risk management and human oversight mechanisms designed to ensure the highest standards of safety, article 26 of the Regulation confers upon users the right to receive appropriate training from providers concerning the proper use of AI systems.

Correspondingly, deployers are required to implement all necessary technical and organisational measures to ensure that such systems are utilised correctly and in accordance with the instructions provided.

Moreover, it must be underscored that, within the employment context, employers are not relieved of liability under occupational health and safety, data protection, or non-discrimination law, where the deployment of AI systems, even if undertaken in conformity with prescribed guidance, results in harm to the fundamental rights of workers.

Additionally, the employer, in its capacity as a deployer, bears specific obligations relating to monitoring and human oversight (entrusted to qualified experts), as well as preventive information duties addressed to workers and their representatives.

In light of these considerations, it follows that the aforementioned safeguards are regarded as essential, albeit formulated in general terms and not fully governing the use of AI in employment relationships. The provisions of this Regulation, its fundamental principles in particular, must therefore be complemented by additional regulatory instruments aimed at addressing the specific risks arising from the deployment of AI technologies in the workplace[778].

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[776] M. PERUZZI, "*Intelligenza artificiale e lavoro: impatto dell'AI Act nella ricostruzione del sistema regolativo Ue e di tutela*", in M. Biasi (a cura di), Diritto del lavoro e intelligenza artificiale, Giuffré, Milano, 2024, pp. 115 ss.

[777] P. LOI, "*Il rischio proporzionato nella proposta di regolamento sull'IA e i suoi effetti nel rapporto di lavoro*", in Federalismi, 2023, p. 242.

[778] M. PERUZZI, "*Intelligenza artificiale e lavoro. Uno studio su poteri datoriali e tecniche di tutela*", Torino, Giappichelli, 2023, pp. 147 ss.

In this respect, other relevant normative instruments come into play, beginning with Principle No. 7 of the European Pillar of Social Rights, proclaimed in Gothenburg in 2017[779]. This principle underscores the necessity of providing workers with information regarding their contractual conditions in order to respond effectively to social and technological transformations; to this end, the European Union has introduced obligations of transparency and rights to information with the objective of safeguarding workers, as the contractually weaker party.

More specifically, this principle establishes the right of workers to receive written information, from the very commencement of their employment relationship, regarding the rights and obligations deriving therefrom, as well as the terms applicable to the probationary period.

Furthermore, in line with the aforementioned Principle No. 7, reflected in Recital No. 3 of Directive (EU) 2019/1152 on transparent and predictable working conditions in the European Union[780], it has been established that, prior to any potential dismissal, workers are entitled to be informed of the reasons for termination, to receive a reasonable period of notice, and to have access to an effective and impartial dispute resolution mechanism. In cases of unjustified dismissal, they are also entitled to an appeal, including adequate compensation[781].

Within this framework, Recital No. 6 ensures that all workers within the EU enjoy an appropriate level of transparency and predictability regarding their working conditions.

Given the inadequacy of Directive 91/533/EEC, which preceded the 2019 Directive, in addressing the transformations of the labour market driven by digitalization, and the resulting uncertainty concerning social protection and the rights applicable to emerging forms of employment, the EU recognised the necessity of establishing a renewed regulatory framework.

According to Recital No. 4, this Directive seeks to guarantee that workers, including, as specified in Recital No. 8, digital platform workers and so-called "false self-employed" persons, receive complete and timely information concerning the essential conditions of their employment[782].

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[779] B. CARUSO, "*I lavoratori digitali nella prospettiva del Pilastro sociale europeo: tutele rimediali legali, giurisprudenziali e contrattuali*", in DRI, 2019, pp. 1005 ss.

[780] *Directive (EU) 2019/1152 of the European Parliament and of the Council of 20 June 2019 on transparent and predictable working conditions in the European Union*, Recital n. 3, in Eur-Lex.

[781] L. ZAPPALA', "*Appunti su linguaggio, complessità e comprensibilità del lavoro 4.0: verso una nuova procedimentalizzazione dei poteri datoriali*", in WP C.S.D.L.E. "Massimo d'Antona".IT, 2022, 462, pp. 114-115.

[782] C. FALERI, "*Management algoritmico e asimmetrie informative di ultima generazione*", in Federalismi, 2024, 3, p. 221.

It thus becomes evident that a fundamental principle of transparency and predictability of working conditions has been introduced, encompassing elements such as work scheduling and organisation, working hours, remuneration, the right to engage in parallel employment, the right to minimum work predictability, and the right to refuse work assignments in the absence of sufficient clarity regarding their terms of execution.

This principle also includes obligations concerning training and related matters, and applies equally to traditional and digital workplaces.

Similarly to Directive 91/533/EEC, the function of information is to mitigate workers' sense of "uncertainty" caused by the complexity of legislation and contractual frameworks, an obstacle that can hinder their full understanding of the rights and duties arising from the employment relationship itself.

This, moreover, may constrain workers' ability to assert rights which, although derived from the employment relationship, are not recognised by the employer.

By contrast, the right to information provided under Directive (EU) 2019/1152 can be characterised as a "*third-generation*"[783] right, designed to ensure *dynamic information*.

The principle of transparency and predictability must serve not only to reflect the current situation but also to secure the foreseeability of future changes.

In a labour context defined by rapid transformations, a lack of clarity may hinder workers' capacity to plan their lives, leading to an expansion of the porous boundaries between work and personal time, an outcome that may ultimately undermine workers' self-determination and adversely affect their physical and psychological well-being.

In particular, in order to ensure the effectiveness of informational obligations, article 15 of the Directive requires Member States to adopt either a "favourable presumption" mechanism, allowing workers to challenge the validity of working conditions that appear unpredictable or non-transparent, whereupon the employer must prove their legitimacy, or to establish a guarantee mechanism enabling workers to lodge complaints before a competent authority and to obtain prompt and effective remedies.

It is evident that these two remedial approaches differ substantially: while the former modifies procedural mechanisms so as to ease the worker's evidentiary burden in disputes, the latter is of a sanctioning and compensatory nature.

Nevertheless, if applied in conjunction, both mechanisms could ensure the genuine effectiveness of the Directive's objectives.

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[783] L. ZAPPALA', "*Transparency and comprehensibility of working conditions and automateddecisions: isitpossible to open the black box?*", in ITALJ, 2023, 2, pp. 12 and 18.

In light of the above, although the Directive seeks to pursue the same goal as Directive 91/533/EEC, namely, to reduce workers' uncertainty regarding their contractual rights and obligations so as to facilitate their enforcement[784], the new instrument introduces an important innovation. As previously noted, it grants workers the right to obtain information not only about existing contractual conditions but also about any future modifications. While this element was already, to some extent, envisaged in the 1991 Directive, the new framework offers a more dynamic and up-to-date understanding of workers' employment status within the evolving digital environment in which they operate[785].

Moreover, it should be observed that Directive (EU) 2019/1152, given its binding nature, does far more than merely revise the 1991 framework.

It overcomes a fundamental limitation of the earlier Directive, namely the lack of legal relevance attributed to the provision of information as probative evidence.

Indeed, whereas the earlier Directive was conceived essentially as an instrument of contractual proof, earning it the epithet *"Cinderella Directive"*[786] due to its limited practical effect, the new Directive explicitly recognises, under article 16, the right of workers to seek redress in cases of violation of their informational rights.

This significantly enhances the enforceability of workers' rights within the EU legal order. In other words, unlike Directive 91/533/EEC, which refrained from interfering with national laws governing the form and content of employment contracts, the new Directive introduces both procedural and substantive rights that workers may invoke before judicial or administrative bodies whenever they have not been adequately informed.

In this regard, the transparency and predictability of contractual conditions, together with detailed written communication, represent an attempt to enhance legal formalism and the so-

[784] A. RIVARA, "*La Direttiva sull'informazione e l'effettività dei diritti*", in DLRI, 1999, pp. 133 ss.

[785] A. ZILLI, "*Condizioni di lavoro (finalmente) "trasparenti e prevedibili"*", in Labor, 2022, n. 6, pp. 661 ss; E. COLAS-NEILA, "*Prestacion a traves de plataformas digitales en la doctrina judicial espanola. Trabajadores por cuenta ajena o autonomos?*", in LLI, 2019, vol. 5, n. 1, pp. 220 ss; J. GORELLI HERNANDEZ, "*Sobre la presuncion de laboralidad de los repartidores de plataformas digitales*", in Trabajo y Derecho, 2022, n. 91, pp. 2 ss.

[786] E. GRAGNOLI, "*Obbligo di informazione del datore di lavoro ed efficacia probatoria dei suoi atti*", in RIDL, 1998, II, pp. 440 ss; in this regard, the European Court of Justice, in the Kampelmann case (joined cases C-253/96 to C-258/96) and subsequently in the Lange case (C-350/99), clarified that the provisions of Article 6 of Directive 91/533, which establish that the Directive does not prejudice national legislation concerning the evidentiary rules on the existence and content of the contract or employment relationship, should be interpreted in such a way as to prevent the information document provided to the worker from being regarded as the sole means of proof regarding the content of the employment relationship.; J. CLARK, M. HALL, "*The Cinderella Directive? Employee rights to informations about conditions applicable to their contract or employment relationship*", in ILJ, 1992, pp. 106 ss.

called proceduralisation in human resource management, an approach capable of balancing the growing flexibility characterising modern forms of employment[787].

Moreover, these provisions offer workers new tools to plan and anticipate their living and working conditions, including remuneration and the possibility of accessing additional employment opportunities.

In this sense, information becomes a means enabling workers to better manage their lives beyond the purely occupational dimension, thereby approaching a "next-generation" right, insofar as it promotes greater substantive freedom within the employment relationship and in professional choices.

At the same time, it serves as an instrument through which workers may scrutinise and, where appropriate, challenge the exercise of managerial prerogatives, particularly those mediated by automated decision-making processes[788].

To complete the European legislative framework on this matter, it is essential to consider the *Directive on Improving Working Conditions in Platform Work*, previously discussed in earlier chapters. This Directive, in its attempt to regulate algorithmic management, introduces a set of safeguards governing the use of such systems, while also seeking to improve workers' psychosocial working conditions, for example, by mitigating perceptions of organisational injustice, rebalancing power asymmetries, and enabling workers to regain a degree of control over their labour.

These are, indeed, well-documented risk factors associated with algorithmic management in platform work.

The Directive, first and foremost, after establishing in articles 7 and 8 the respective limitations on the processing of personal data through monitoring and automated decision-making systems and the requirement to conduct data protection impact assessments, stipulates that digital labour platforms must provide detailed information concerning the use of automated decision-making systems.

Pursuant to article 9 (para. 1), (para. 2), such information must be presented in a "transparent, comprehensible, and easily accessible manner, using clear and plain language", in accordance with article 12 (para. 1) *GDPR*, and made available to workers, their representatives, and national authorities prior to the system's deployment.

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[787] G. FERRARO, "*Formalismo giuridico e diritto del lavoro*", in DLRI, 1989, pp. 568 ss.

[788] L. ZAPPALA', "*Transparency and comprehensibility of working conditions and automateddecisions: isitpossible to open the black box?*", *cit*., p. 116.

This requirement enables all relevant stakeholders to access the necessary information to assess potential negative impacts of automated decision-making on occupational health and safety, including excessive workloads or discriminatory practices, while simultaneously reducing power asymmetries between the platform and its workers.

It also allows workers to gain clarity and understanding regarding the processes and outcomes of automated decisions.

Secondly, pursuant to article 10 (para.1) of the Directive, the use of automated decision-making shall be subject to human supervision and evaluation, particularly with respect to its impact on working conditions and workplace discrimination.

Furthermore, under article 10 (para. 2), adequate resources must be ensured so that the individual performing such evaluations possesses the requisite training and competence and, where necessary, the authority to override automated decisions.

This mechanism permits human operators to assess the implications of automated decision-making, including its impact on health and safety at work, and to amend or suspend such systems should any unacceptable risk be identified.

It must further be noted that human oversight is likely to have the potential to improve psychosocial working conditions, and more specifically organisational fairness and the balance of power within the employment relationship.

This is particularly relevant considering that procedural opacity has often been exploited by platforms to circumvent negotiation and to impose unfair practices on a "*take-it-or-leave-it*" basis.

Thirdly, pursuant to article 11 (para. 1), workers shall have the right to obtain an explanation regarding any decision taken or supported by an automated process and to request a human review of such decision.

This provision reinforces workers' autonomy in relation to automated decisions affecting them and may contribute to mitigating occupational health and safety risks associated with automated decision-making[789].

It is reasonable to assume that this rule has the potential to rebalance power asymmetries, enhance workplace fairness, and afford workers a degree of control over their work, insofar as they are empowered to respond to unjust decisions.

[789] EU-OSHA, "*Digital platform work and occupational safety and health: overview of regulation, policies, practices and research*", in Eu-Osha, 2022.

Indeed, one of the most commonly reported sources of frustration and anxiety among platform workers lies precisely in the absence of effective means to challenge unfair platform decisions or unethical behaviour by customers[790].

Fourthly, article 12 (para. 1) establishes a specific section dedicated to occupational health and safety, providing that digital labour platforms must assess risks stemming from automated decision-making and monitoring systems, with particular attention to ergonomic and psychosocial risks, as well as workplace accidents.

Platforms are further required to evaluate the adequacy of safeguards in light of the specific characteristics of the working environment and to introduce appropriate preventive and protective measures[791].

To this end, paragraphs 2 to 5 of the same article stipulate that platforms must refrain from using automated systems where such use endangers workers' physical or mental health and safety (paragraph 3), and must ensure information and consultation procedures (as also provided for in articles 13 and 14).

These provisions require platforms to inform and consult workers and to establish reporting channels set up by Member States, applicable also to any modification or alteration of the automated decision-making system and to preventive actions aimed at avoiding incidents such as violence or harassment.

Ultimately, it must be emphasised that digital platforms often suffer from a lack of transparency and accountability, which makes it difficult for public authorities to obtain information regarding workers and their working conditions.

Platform workers, in this respect, frequently struggle to assert their rights, including those related to health and safety, owing to insufficient information and inadequate communication channels, factors that can, in turn, generate stress and anxiety.

Accordingly, article 17 (para. 1) of the Directive introduces a series of measures designed to address these issues, imposing upon platforms the obligation to provide competent authorities with data concerning workers, working hours, earnings, and working conditions.

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[790] P. BERASTEGUI, *"Exposure to psychosocial risk factors in the gig economy: A systematic review"*, *cit*.

[791] COUNCIL OF THE EUROPEAN UNION, *Proposal for a directive of the European Parliament and of the Council on improving working conditions in platform work - Analysis of the final compromise text with a view to agreement*, in Europa.eu, 2024b; A. TODOLI' SIGNES, "*La regulación de la inteligencia artificial en la Directiva de trabajo en plataformas digitales*", in Revista UC3M, 2024, vol. 5, pp. 35 ss., A. TODOLI' SIGNES, "*La Directiva para la mejora de las condiciones laborales en plataformas digitales de trabajo. Contenido y propuestas para la trasposicion*", in AEDTSS, 2024, A. FERNANDEZ GARCIA, "*La presuncion de laboralidad y de la gestion algoritmica en la Directiva 2024/2831 relativa a la mejora de las condiciones laborales en el trabajo en plataformas digitales*", in Revista Justicia y Trabajo, 2024, n. 5, pp. 87 ss.

2. Occupational health and safety protection in the digital era: regulatory evolution and challenges for a functional approach in the Italian legal system.

In an era in which innovations are radically transforming the world of work, it must be acknowledged that the "old" work environment continues to coexist; on one hand, new work realities increasingly revolve around interactions between workers and digital technologies or artificial intelligence, mediated by sophisticated and discreet devices, while, on the other hand, the traditional world remains characterised by the relationship between workers and physical machinery or tangible structures.

The right to occupational health and safety, which began to develop in the nineteenth century, has always been based on a visible and tangible organisation of workplaces and equipment, inspiring the concept of a "*reified organisation*"[792], which requires physical spaces for machinery and other production tools, as well as for the workers who operate them.

Within this context, the workplace has always represented a central element, as well as the epicentre of the primary risks for those employed there.

In this regard, Italian legislation, codified in Legislative Decree No. 81/2008, still focuses on the protection of safety within "places" of work, even though the European Framework Directive 89/391/EEC emphasises protection "during" work, thereby placing a stronger temporal focus.

At the same time, article 2087 of the Civil Code[793] remains modern and applicable, as it does not limit itself to space or time but concentrates on the "exercise of the enterprise": while initially this concept immediately evoked a physical location, today it can extend to non-physical contexts where the business activity is nonetheless carried out[794].

Therefore, exploring the new coordinates of prevention entails assessing the continuing validity of older approaches in a labour environment that is evolving, where, among the many factors generating psychosocial risks, the connection to physical space and time tends to weaken. Legislative Decree No. 81/2008, in some of its key definitions, may appear to adopt a more functional approach than its title suggests.

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[792] P. PASCUCCI, "*Prevenzione e organizzazione nel diritto della sicurezza sul lavoro*", in Sociologia del diritto, 2011, n. 3, pp. 175 ss.

[793] P. ALBI, "*Adempimento dell'obbligo di sicurezza e tutela della persona. Art. 2087*", Milano, Giuffrè, 2008.

[794] A. DELOGU, "*La funzione dell'obbligo generale di sicurezza sul lavoro. Prima, durante e dopo la pandemia: principi e limiti*", Fano, Aras Edizioni, 2022.

In particular, article 2, letter (a), defines the "*worker*"[795] based on the inclusion of the work performance within the employer's organisation, without making any specific reference to a location or working hours.

Such a definition, therefore, does not rely on the type of contract and can only be mitigated through the protection afforded under article 2087 of the Civil Code[796], although its applicability outside of subordinate employment remains uncertain despite some openings[797].

Similarly, the "*employer*"[798] is defined based on the actual responsibility over the organisation in which the worker operates, demonstrated through the exercise of decision-making and spending powers[799].

By referring simply to the organisation without further specification, the 2008 legislator developed a considerably broader concept, capable of encompassing both a physical structure and a set of rules and regulations governing the production project.

2.1. Workplace safety between regulatory innovation and risk control: the role of "legal availability".

[795] This article, titled "*Definitions*", letter a), defines a "*worker*" as "*a person who, regardless of the type of contract, carries out work within the organisation of a public or private employer, with or without remuneration, even solely for the purpose of learning a trade, craft, or profession, excluding domestic and family service workers. Equated to such a worker are: the cooperative or company member, including de facto members, who provides their activity on behalf of the company or entity; the participant in a profit-sharing agreement referred to in Articles 2549 et seq. of the Civil Code; beneficiaries of training and orientation internships under Article 18 of Law No. 196 of 24 June 1997, as well as under specific regional laws aimed at facilitating alternation between study and work or supporting career choices through direct knowledge of the labour market; students of educational and university institutions and participants in vocational training courses involving the use of laboratories, work equipment in general, chemical, physical, and biological agents, including equipment with display screens, but only for periods in which the student is actively engaged with such equipment or laboratories; volunteers of the National Firefighters Corps and Civil Protection; and workers covered by Legislative Decree No. 468 of 1 December 1997, as subsequently amended*," in Normattiva

[796] P. PASCUCCI, "*Dopo la legge n. 123 del 2007. Prime osservazioni sul Titolo I del decreto legislativo n. 81 del 2008 in materia di tutela della salute e della sicurezza nei luoghi di lavoro*", in WP C.S.D.L.E. "Massimo D'Antona" .IT, 2008, 73, p. 47.

[797] G. NATULLO, "*Principi generali della prevenzione e "confini" dell'obbligo di sicurezza*", in M. RUSCIANO e G. NATULLO (a cura di), Ambiente e sicurezza del lavoro. Appendice di aggiornamento alla legge 3 agosto 2007, n. 123, in F. CARINCI (diretto da), Diritto del lavoro. Commentario, Torino, Utet, VIII, 2008, p. 83.

[798] Article 2 of Legislative Decree 81/2008, titled "*Definitions*", letter b), defines the "*employer*" as "*the entity holding the employment relationship with the worker or, in any case, the person who, according to the type and structure of the organisation within which the worker performs their activity, has responsibility for the organisation itself or the production unit by virtue of exercising decision-making and spending powers. In public administrations referred to in Article 1, paragraph 2, of Legislative Decree No. 165 of 30 March 2001, the term 'employer' refers to the manager vested with management powers, or to the non-managerial official only in cases where the latter is in charge of an office with autonomous management, designated by the top body of each administration, taking into account the location and functional scope of the offices in which the activity is carried out, and endowed with independent decision-making and spending powers. In the absence of designation, or if the designation does not comply with the criteria indicated above, the employer coincides with the top body itself*", in Normattiva.

[799] C. LAZZARI, "*Figure e poteri datoriali nel diritto della sicurezza sul lavoro*", Milano, Franco Angeli, 2015.

A significant step towards redefining the relevance of the workplace was taken by the legislator with Legislative Decree No. 81/2015, which regulates workers engaged in the delivery of goods on behalf of third parties, within urban areas, and using means such as bicycles or motor vehicles through digital platforms.

In such cases, the protections provided by Legislative Decree No. 81/2008 apply not only when these workers are formally subordinate employees or hetero-organised collaborators (and thus comparable to subordinate employment), but also when they are self-employed workers. In this latter scenario, it is the client making use of the platform who must comply with the provisions of Legislative Decree No. 81/2008 and bear the related costs.

The issue concerns whether this latter principle implies the full application of Legislative Decree No. 81/2008[800], or only of its article 21, which refers specifically to the protection of self-employed workers, and how this aligns with the client's obligation to cover such costs[801].

Whit regard to *riders*[802], whether subordinate or self-employed, the place of work is the public road, an environment over which neither the employer nor the client can exercise exclusive control. Therefore, referring to the "irrelevance of the workplace" does not mean denying the existence of a physical location, but rather emphasising that such a location is not entirely under the employer's control, as would be the case in a company premises[803]. Nonetheless, this regulatory shift is accompanied by a return to more traditional positions concerning quasi-subordinate work and the amendments introduced by Legislative Decree No. 106/2009 on occupational safety in subcontracting.

These amendments establish that the provisions of article 26 of Legislative Decree No. 81/2008[804] apply only when the employer has legal availability of the premises where the contract is performed, a restriction that risks undermining the important preventive protection extension to corporate production cycles introduced by Law No. 296/2006.

The 1989 Framework Directive, previously discussed, requires cooperation among companies operating within the same location, even when that location is not under the exclusive control of a single entity. Furthermore, the *Court of Justice of the European Union* interprets this

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[800] P. TULLINI, "*Prevenzione e tutela della sicurezza sul lavoro nell'economia digitale*", in RDSS, 2021, pp. 671 ss.

[801] P. PASCUCCI, "*Note sul futuro del lavoro salubre e sicuro... e sulle norme sulla sicurezza di rider & co*.", in DSL, 2019, 1, I, pp. 48 ss.

[802] S. GIUBBONI, "*I riders e la legge*", in RDSS, 2019, pp. 847 ss.

[803] C. LAZZARI, "*Lavoro senza luogo fisso, de-materializzazione degli spazi, salute e sicurezza*", in LLI, 2023, n. 1, pp. 22 ss.

[804] R. GUARINIELLO, "*Sicurezza e appalti: incroci pericolosi?, in G. SCLIP (a cura di), Sicurezza accessibile. Sicurezza e appalti: un incrocio pericoloso?*", Trieste, EUT, 2020, pp. 63 ss.

directive broadly, so as to include as many workers as possible within its scope[805]. Views on the concept of "*legal availability*", whether attributed to contractors or understood as material availability, must, however, respect the penal nature of article 26, which is subject to restrictive interpretation.

The meaning of "*legal availability*" can be found in case law, notably in the judgment of the Joint Sections of the *Court of Cassation* in the well-known *ThyssenKrupp* case[806], which highlights the importance of the "*competence for risk*" theory.

This theory[807] identifies a subject responsible for a specific sphere of risk, which must be managed according to precise precautionary rules and through the possession of appropriate competence, a competence that necessarily entails the existence of powers required for its exercise. In essence, according to this theory, legal availability exists whenever there is a lawful use of a place, with the corresponding powers, and, consequently, duties, linked to such legitimate use[808].

In other words, legal availability does not necessarily entail the ability to modify a place, as would be the case for those holding a real right over it.

In this respect, even in the absence of such direct power, if there exists a lawful use of the place, the powers associated with that use also give rise to corresponding obligations; duties, therefore, are shaped by the powers actually held, and the competence for risk assumes a form that reflects the extent of those effective powers.

In this way, the imposition of obligations on the commissioning employer that they could not realistically fulfil is avoided, preventing the requirement of actions that fall beyond their actual capacity for control[809].

2.2. Workplace safety between tradition and innovation: emerging challenges, new technologies, and employer responsibilities.

[805] O. BONARDI, "*La sicurezza del lavoro nella Comunità europea, nella Costituzione e nella legge di semplificazione n. 229/03*", in RGL, 2004, I, p. 437.

[806] Italian Supreme Court, Criminal Section, Joint Divisions, 18 september 2014, n. 38343, in Cassazione Penale, Sez. Unite, 18 settembre 2014, n. 38343 - Thyssenkrupp: le condanne inflitte andranno ridefinite, ma non aumentate.

[807] S. DOVERE, "*Appalti e salute e sicurezza sul lavoro*", video recording of the presentation delivered at the second edition of the International Festival of Occupational Health and Safety, held at the Ducal Palace of Urbino, organised by the Olympus Observatory of the University of Urbino Carlo Bo and the Rubes Triva National Safety Foundation, in https://www.youtube.com/watch?v=OXilBUoaU-A.

[808] S. DOVERE, "*Appalti e salute e sicurezza sul lavoro*", *cit*.

[809] S. DOVERE, "*Appalti e salute e sicurezza sul lavoro*", *cit*.

It is evident that the aforementioned theory of competence for risk appears to offer a viable framework for attributing responsibilities beyond the narrow confines of procurement law, thereby potentially overcoming the limitations imposed by the legislature with respect to the employer's premises, particularly in the context of protecting quasi-subordinate work.

However, once this application of Legislative Decree No. 81/2008 is accepted, it must be reconciled with practical reality, given that many provisions of the decree were designed with traditional spatial and temporal frameworks in mind, which may complicate their implementation. Indeed, if the employer's primary duty in terms of prevention is to assess all risks, one must then ask how they might consider risks that extend beyond the physical boundaries of the enterprise.

In this regard, insofar as the workplace becomes less clearly defined, it is necessary to evaluate risks that can reasonably be linked to the performance of work even in decentralised contexts; this requires a careful preliminary assessment of the work process, in line with the principle of primary prevention established at the EU level, whereby risks must be avoided or eliminated from the outset[810].

Moreover, given that risk assessment gives rise to obligations concerning information and training pursuant to articles 36 and 37 of Legislative Decree No. 81/2008, such training should focus on the specific modalities of work performance, potentially employing simulation techniques to prepare workers for diverse scenarios.

These considerations become particularly salient in the context of a distinctive form of work, somewhat analogous to platform-based work, known as "*agile working*" (the so-called *lavoro agile*).

Defined in article 18 of Law No. 81/2017 as a "*way in which a subordinate employment relationship is conducted*", agile working involves an alternation between work carried out on-site, subject to certain spatial and temporal constraints[811], and remote work, which, conversely, is free from such constraints; through the use of technological tools, work can be organised "*by phases, cycles, and objectives*" (art. 18).

This form of work essentially represents an initial acknowledgment of how new technologies, in a rapidly developing society, enable the execution of tasks without spatial-temporal constraints, thereby challenging traditional modes of work within a physical organisational framework, alongside a more nuanced exercise of managerial authority. It should also be

[810] B. MAGGI, "*L'analisi del lavoro a fini di prevenzione*", in Quaderni di diritto del lavoro e delle relazioni industriali, 2006, n. 29, pp. 13 ss.

[811] S. BELLOMO, "*Forme di occupazione "digitale" e disciplina dell'orario di lavoro*", in Federalismi, 2022, n. 19, pp. 166 ss.; V. BAVARO, "*L'orario di lavoro agile "senza precisi vincoli'*"", in LDE, 2022, n. 1.

observed that, within this context, the digital worker enjoys a degree of autonomy in performing their tasks, manifested in the ability to choose the methods and timing of their work.

Nevertheless, it must be emphasised that this autonomy remains situated within the employer's unilateral and digital organisation, within which managerial, supervisory, and disciplinary powers are exercised (for example, through the platform's application), to ensure that work is performed in the interest of the enterprise.

This, therefore, gives rise to a form of "*digital subordination*"[812], reflecting the ability of subordinate work to transcend the traditional spatial and temporal categories that have historically[813] characterised labour, and demonstrating remarkable adaptability.

Indeed, as a product of the reconfigured organisational framework, compatible with the aforementioned autonomy of the worker, it does not entail any revision of the provisions set out in article 2094 of the Italian Civil Code[814].

Against this backdrop, the preventive dimension, which, in certain respects, may also extend to platform-based work, is evident both in the provision by the employer of a risk information notice pursuant to article 22 of Law No. 81/2017[815], and in the more transformative possibility of establishing an individual agreement, which may be tailored through collective bargaining to provide general guidance, including a clear delineation of the limits to worker mobility.

In such circumstances, the cooperation of the worker in matters of safety assumes particular importance, as recognised by Law No. 81/2017 and the "*National Protocol on Agile Working*" in the private sector, dated 7 December 2021[816].

A key element of this Protocol is found in article 6.2, which mandates that workers be informed of any significant changes to working arrangements that may impact health and safety. This provision aligns with article 29 (para. 3) of Legislative Decree No. 81/2008, which, through a "dynamic" approach to the management of the prevention system (designed

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[812] F. CARINCI, "*La subordinazione rivisitata alla luce dell'ultima legislazione: dalla "subordinazione" alle "subordinazioni"*? in ADL, n. 4-5, 2018, pp. 968 ss.

[813] M. MARTONE, "*Lo smart working nell'ordinamento italiano*", in DLM, 2018, p. 295.

[814] P. ICHINO, "*Il lavoro subordinato: definizione e inquadramento. Artt. 2094 2095*", in P. SCHLESINGER (diretto da), il Codice Civile. Commentario, Giuffré, Milano, 1992, pp. 158 ss.

[815] G. LUDOVICO, "*Lavori agili e subordinazioni*", Milano, Giuffrè Francis Lefebvre, 2023, pp. 312 ss.

[816] The "*National Protocol on Agile Working*" in the private sector is an agreement reached on 7 December 2021 by the social partners, namely Cgil, Cisl, Uil, Ugl, Confsal, Cisal, Usb, Confindustria, Confapi, Confcommercio, Confesercenti, Confartigianato, Cna, Casartigiani, Alleanza Cooperative, Confagricoltura, Coldiretti, Cia, Copagri, Abi, Ania, Confprofessioni, Confservizi, Federdistribuzione, Confimi, and Confetra.
The key points of this Protocol comprise voluntary participation in smart working; the individual agreement; disconnection; health, safety, accidents, and other occupational diseases; equal treatment, equal opportunities, and the protection of vulnerable and disabled workers; and training. See https://www.lavoro.gov.it/notizie/Documents/PROTOCOLLO-NAZIONALE-LAVORO-AGILE-07122021-RV.pdf.

to address the impact of new technologies), imposes an obligation to promptly revise the risk assessment whenever changes to the production process or organisation of work are required that are relevant to health and safety[817].

Nevertheless, the employer cannot entirely relinquish their powers, in particular the duty of supervision enshrined in Legislative Decree No. 81/2008, which serves to safeguard the health and safety of workers. In practice, emerging work scenarios necessitate a careful balancing of the roles of both parties, whilst preserving the foundational guarantees of prevention.

Lastly, it must be acknowledged that the contemporary world of work presents novel risks to the health and safety of workers. Alongside the traditional hazards of industrial society, there now exist more "underlying" risks, psychological and social in nature, which are no less insidious and may also have physical consequences.

This perspective aligns perfectly with the definition of health as a state of complete bio-psycho-social well-being, as adopted in Legislative Decree No. 81/2008[818].

In this context, while the 2008 legislature had already addressed emerging risks, such as those related to work-related stress[819], it is evident that the accelerated impact of new technologies on work organisation necessitates further adjustments in preventive measures, particularly to mitigate the effects that various forms of artificial intelligence may exert on workers employed through digital platforms.

Indeed, such technologies may jeopardise what article 2087 of the Civil Code defines as the "moral personality" of workers, which underpins their very dignity. In support of this, it is instructive to highlight certain key aspects of the Directive on the protection of health and safety for platform workers, with particular reference to the amendments introduced by the European Parliament.

These points, although not directly applicable to self-employed workers, nonetheless warrants concise emphasis[820].

Primarily, the Directive imposes upon platforms the obligation to avert risks to the psychological and mental health of workers arising from the use of automated decision-

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[817] "*National Protocol on Agile Working*", *cit*.

[818] See, in this regard, article 2, letter o), which states that "*health*" is a "*state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity*", in www.normattiva.it.

[819] L. ANGELINI (a cura di), "*La prevenzione dei rischi da stress lavoro-correlato. Profili normativi e metodiche di valutazione. Atti del Convegno di Urbino dell'8 novembre 2013*", ne I Working Papers di Olympus, 2014, n. 31.

[820] P. PASCUCCI, "*Dignità del lavoratore e sicurezza del lavoro*", In the process of being published in the Proceedings of the Conference on the Dignity of Work and Digital Civilization, held in Rome at the Accademia dei Lincei on 24 February 2023.

making and monitoring systems. Platforms must also identify and mitigate unavoidable risks through sufficiently resourced and competent human personnel, endowed with the necessary training and authority to oversee such risks, thereby underscoring the principle of "*human oversight*" of automated systems.

Moreover, platforms are required to immediately suspend the operation of any automated system where the impact assessment reveals risks to workers' health, safety, or fundamental rights that cannot be eliminated.

The use of decision-making or monitoring systems that could, in any manner, subject workers to undue pressure or jeopardise their physical or mental well-being is strictly prohibited; this aligns with the fundamental principle that decisions affecting health and safety must be taken by humans rather than machines.

Ultimately, platforms are obliged to inform workers regarding the automated decision-making systems employed in determining significant aspects of their working conditions, including impacts on health and safety.

This principle also applies in the context of implementing new technologies, which may proceed only following consultation with workers and their representatives to assess the potential effects of technological choices on the workplace environment.

Furthermore, the matter of the right to disconnect must be considered[821]; although not universally recognised as a worker's right, it nonetheless constitutes an important preventive measure for the employer.

Complementing the foregoing, it should be noted that Decree-Law No. 48/2023 has extended the employer's obligation to appoint a competent physician, both in cases already envisaged under Legislative Decree No. 81/2008 and whenever such appointment is necessitated by the risk assessment.

This development reflects a contemporary trend in many organisations, where occupational health surveillance programmes extend beyond statutorily regulated risks to encompass other hazards, including climatic conditions or improper postures, provided these are identified in the risk assessment.

However, while the risk assessment may justify the appointment of a competent physician, ultimate responsibility remains with the employer, with the cooperation of the head of the prevention and protection service.

[821] S. MAGAGNOLI, "*Diritto alla disconnessione e tempi di lavoro*", in LLI, 2021, vol. 7, n. 2, pp. 87 ss.

Such a choice may nevertheless require periodic reconsideration, in light of emerging health risks, which demand the specialised expertise of a physician to be accurately identified[822].

Two further obligations incumbent upon the employer must not be overlooked.

The first concerns the duty of training, which must be adequate and sufficient, even in cases where the worker's place of work is not known to the employer.

In such instances, consultation with the workers' safety representative is essential in organising training activities and conducting risk assessments (art. 50, para. 1, letters b) and d), Legislative Decree No. 81/2008)[823].

The second relates to the pivotal role of art. 30 of Legislative Decree No. 81/2008, regarding the *Management and Organisation Model* (MOG), which serves as an instrument enabling the employer to fulfil all obligations concerning risk assessment and management imposed under Legislative Decree No. 81/2008[824].

With regard to reforms, a governmental bill on artificial intelligence is currently under consideration in the Italian Parliament[825].

Grounded in the so-called "*anthropocentric*" principle[826], the proposal envisages limitations on the use of AI in the workplace, with a view to effecting genuine improvements in working conditions and ensuring full and effective protection of workers' psycho-physical integrity[827].

3. *Occupational health and safety in the Spanish legal system: challenges and protections for workers engaged via digital platforms.*

In the Spanish system, with regard to the rights and obligations concerning occupational risk prevention for workers employed via apps, these largely depend on their legal classification as either employees or self-employed workers[828].

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[822] P. PASCUCCI, "*Le nuove coordinate del sistema prevenzionistico*", in DSL, 2023, 2, p. 45.

[823] C. LAZZARI, "*Lavoro senza luogo fisso, de-materializzazione degli spazi, salute e sicurezza*", in LLI, 2023, pp. 43-49.

[824] L. ANGELINI, "*La valutazione di tutti i rischi*", in Salute e Sicurezza sul Lavoro, 2019, p. 98.

[825] This concerns Bill No. 1146, entitled "*Provisions and Delegation to the Government regarding Artificial Intelligence*", approved by the Council of Ministers on 23 April 2024 and currently under discussion in the Senate.

[826]See Press Release No. 78 of the Council of Ministers, 23 April 2024, available at, https://governo.it/it/articolo/comunicato-stampa-del-consiglio-dei-ministri-n-78/25501

[827] This refers to Article 10 of the current text.

[828] F. X. GOMEZ GARCIA, "*Retos para la protección de la seguridad y sa lud en el trabajo en plataformas digitales*", in Monereo Pérez, José Luis, Túlio Ba rroso, Fabio y Las Heras, Horacio (Dirs.), El futuro del derecho del trabajo y de la se guridad social en un panorama de reformas estructurales: Desafíos para el trabajo decente, Murcia, Laborum, 2018, p. 1091.

At the outset, it is useful to outline the principal aspects of risk prevention, particularly psychosocial risks, within the context of employment relations in Spain.

Primarily, one of the legislative measures of relevance in this context is undoubtedly Law 31/1995 of 8 November on the *Prevention of Occupational Risks* (*LPRL*), which transposes the European Framework Directive 89/391/EEC, together with the regulations associated therewith. In this regard, article 3, paragraph 1, of the *LPRL*, which defines its scope of application, establishes that this legislation and its implementing decrees apply to employment relations governed by the *TRLET* (the *Statute of Self-Employed Workers*, to be discussed in more detail below).

This law is designed to establish the obligations of companies concerning the management of risk prevention, focusing on the design and implementation of prevention plans through appropriate risk assessments, as well as the planning and concrete implementation of preventive measures. Moreover, there are certain general obligations contained in Chapter III of the *LPRL* regarding rights and duties, in particular articles 14 to 29, which essentially enshrine the right of workers to effective occupational health and safety protection and the corresponding duty of the employer to provide such protection.

Such a right also manifests in the employer's obligation to identify and evaluate risks, implementing all preventive measures deemed necessary, alongside the provision of training and information regarding such risks.

Under this legislative framework, the right of workers to effective occupational health and safety protection entails, according to article 14.1 of the *LPRL*, the employer's duty to safeguard workers from occupational hazards; it follows that, within the context of subordinate employment, the employer bears responsibility for the health and safety of the workers under their supervision[829], as it is incumbent upon the employer to integrate risk prevention into company activities and to adopt all necessary measures to ensure effective protection of workers' health and safety.

In particular, this obligation is realised through the planning of risk prevention, hazard assessment, worker training and information, coordination in emergency situations or cases of serious and imminent risk, and health surveillance.

[829] A. ESCUDERO PRIETO, "*El método operativo para integrar la prevención en la coordinación de actividades empresariales*", in Revista General de Derecho del Trabajo y de la Seguridad Social, 2009, núm. 19, p. 1.

Furthermore, pursuant to article 14.2 of the *LPRL*, the employer is required to conduct continuous monitoring in order to improve the identification, assessment, and control of unavoidable risks and to ensure adequate levels of protection.

Specifically, the legislation provides for the so-called *vigilancia de la salud* (health surveillance), which consists of an annual medical examination aimed at assessing workers' physical and mental conditions. This entails, for the company, a sort of "dispensation" from obligations directly tied to the employment contracts or working relationships.

However, although the *LPRL* does not explicitly refer to psychosocial risks, Spanish jurisprudence has recognised its applicability to all types of occupational risks, including the former. Indeed, the *LPRL* itself has contributed to the evolution of the concept of occupational health and safety from mere "*safety and hygiene*" to "*safety and health*", encompassing elements such as wellbeing and mental health, thereby incorporating psychosocial risks and recognising them as occupational hazards.

This framework is further enriched by Royal Decree 39/1997, concerning the regulation of prevention services (*Reglamento de los Servicios de Prevención*, hereinafter *RSP*), which sets out specific requirements regarding risk assessment methodologies and the implementation of preventive measures.

The *RSP*, building upon the *LPRL*, seeks to establish minimum health and safety requirements in the workplace, while simultaneously addressing measures specifically targeting psychosocial risks. It also delineates the obligations of organisations to implement risk assessment methodologies, training programmes, and preventive measures tailored to particular contexts, in which psychosocial factors related to the work environment play a crucial role[830], especially where there exists a high risk of occupational accidents and work-related illnesses.

Regarding risk assessment, article 4 of the *RSP* is particularly noteworthy.

Essentially, it pertains firstly to each individual workstation within a company where risks cannot be entirely eliminated; the assessment must take into account both the existing or anticipated working conditions, as outlined in article 4, paragraph 7 of the *LPRL*, and the particular and potential susceptibility of workers (current or future) to such conditions, for example based on their personal characteristics.

Moreover, based on this initial assessment, workstations must be reassessed whenever certain situations arise, such as the selection of new equipment, the use of chemical substances or

[830] B. MORENO JIMENEZ, "*Factores y riesgos psicosociales, formas, consecuencias, medidas y buenas prácticas*", in INSHT, Madrid, 2010, p. 13.

preparations, the introduction of new technologies, structural modifications in the workplace, organisational, procedural, or environmental changes that may affect risk levels, or the recruitment or transfer of individuals whose personal characteristics or known biological conditions render them more vulnerable to specific risks.

Clearly, such risk assessments must be conducted by qualified personnel, as stipulated in Chapter VI of the decree. Article 37, paragraph 3, specifies that health personnel within the prevention service are required to evaluate workers' health monitoring data using epidemiological criteria and to collaborate in identifying the links between workplace risks and health outcomes, providing recommendations for improvement[831].

Furthermore, article 34 of the *RSP* specifies that individuals responsible for training on the aforementioned risks, at a senior level, must complete no fewer than 40 hours of training focused on "*Ergonomics and Applied Psychosociology*"[832].

However, despite the fact that the regulatory measures reviewed above do not apply directly to self-employed workers, it should be noted that they are nonetheless obliged to comply with certain occupational risk prevention duties, particularly when working in coordination with other companies. These obligations include conducting risk assessments, implementing preventive measures, and collaborating with companies with which they share workplaces or activities.

The duty to protect against psychosocial risks also fundamentally focuses on safeguarding various fundamental rights enshrined in different laws, including the Spanish Constitution, specifically with regard to the right to physical and moral integrity, and the right to respect for dignity, privacy, equal treatment, and non-discrimination.

Furthermore, article 32 of Law 33/2011 on *General Public Health* establishes that occupational health should be oriented towards achieving the highest degree of physical, mental, and social wellbeing of workers in relation to the characteristics and risks of the workplace, the working environment, and its influence on the surrounding environment,

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[831] B. MORENO JIMENEZ, "*Factores y riesgos psicosociales, formas, consecuencias, medidas y buenas prácticas*", *cit*., p. 11.

[832] F. J. LLANEZA ALVAREZ, "*Ergonomía y Psicosociologia Aplicada*", Valladolid, Lex Nova, 2003; G. PEREZ, Y. GALLEGO, "*Batería MC-UB de evaluación de riesgos psicosociales en la pequeña y mediana empresa*", Trabajo presentado a la 5ª Jornada Nacional de Ergonomía y Psicosociologia. Avilés, 2006; N. WARREN, "*Psychosocial and work organizational risk factors for work related musculoesqueletal disorders*", En W.Karwoswki (Ed.), International Encyclopedia of Ergonomics and Human factors, Oxford CRC Press, 2010, pp. 1299 ss.; R. WESTGAARD, J. WINKEL, "*Ergonomics interventions research for improved musculoskeletal health: a critical review*", in International Journal of Industrial Ergonomics, 1997, 20(6), pp. 463 ss.

whilst simultaneously promoting preventive, diagnostic, therapeutic, adaptive, and rehabilitative measures for work-related or work-associated conditions.

Additionally, the Ministry of Labour and *Social Security Ordinance* ESS 1451/2013 of 29 July 2013 (transposing Directive 2010/32/EU and signed by both public and private entities) enumerates a series of provisions aimed at preventing injuries caused by sharp instruments in the healthcare and hospital sectors. The relevance of this ordinance lies in the fact that it represents the first legal instrument, in terms of psychosocial risk prevention, to explicitly and concretely mention the obligation to assess such risks, a requirement that, although already anticipated under article 16.2 of the *LPRL*, had hitherto been formulated in a generic and non-specific manner.

Another significant legislative measure is Royal Legislative Decree 2/2015 of 23 October, which approves the consolidated text of the *Workers' Statute* (*TRLET*), as well as Law 20/2007 of 11 July, establishing the *Statute of the Self-Employed Worker* (*LETA*).

Both statutes, drawing on article 15 of the Spanish Constitution[833], recognise workers' right to physical integrity[834], as well as their right to health and safety protection at work, although they employ differing terminology reflecting two distinct levels of protection: while employees are entitled to so-called "effective" protection, self-employed workers are entitled to "adequate" protection[835].

This legislative framework is primarily oriented towards ensuring risk prevention within labour law, establishing both the right of workers to adequate risk prevention, safety, and hygiene, as well as safeguarding their privacy and protection against discrimination, and the corresponding obligation of employers to promote workers' safety and provide training in this context.

The statute also governs collective agreements, which play a crucial role within the legal framework regulating employment relationships and working conditions.

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[833] Article 15 of the Spanish Constitution states that: "*Everyone has the right to life and to physical and moral integrity, and no one shall, under any circumstances, be subjected to torture or to inhuman or degrading punishment or treatment. The death penalty is abolished, except as may be provided by military criminal laws in times of war*", available at Boletin Oficial de Estado.

[834] Article 4 of the TRLET, entitled "*Labour Rights*", paragraph 2, letter d), affirms that: "Within the employment relationship, workers have the right to their own physical integrity and to an adequate occupational risk prevention policy", available at Boletin Oficial de Estado. Article 4 of the LETA, entitled "*Professional Rights*", paragraph 3, letter e), provides that: "*In the exercise of their professional activity, self-employed workers enjoy the following individual rights: to their physical integrity and to adequate protection of their occupational safety and health*", available at Boletin Oficial de Estado.

[835] With regard to this, article 19 of the TRLET, entitled "*Occupational Safety and Health*", paragraph 1, states that: "*In the performance of their duties, workers shall have the right to effective protection in matters of occupational safety and health*", in Boletin Oficial de Estado.

They establish the legal basis for collective bargaining in Spain and may be negotiated at various levels, namely company, sectoral, or intersectoral.

Once agreed, collective agreements are binding on the parties involved, meaning that both employers and workers must adhere to the terms set forth in the agreement; such binding nature effectively grants these agreements quasi-legal status, shaping employment relationships in practice[836].

In summary, preventive measures for employees unfold in two phases: an initial phase of designing the preventive activity, in which the employer adopts the necessary measures to safeguard workers, followed by a second phase of implementing the prescribed measures in practice[837].

Should any harm occur that ought to have been prevented, or should deficiencies in the adopted measures emerge, the employer is obliged, under article 16.3 of the *LPRL*, to conduct an investigation to identify the underlying causes.

Despite these provisions, it should be noted that the legal classification of work performed via apps as subordinate does not exempt workers from occupational risks. Indeed, the specific characteristics of this type of work, and the associated traditional and emerging risks, pose a genuine challenge to employers in terms of prevention.

Spanish occupational risk prevention legislation was conceived to address hazards inherent in conventional forms of work; consequently, a review and adaptation to the new realities of the labour market is necessary.

It should also be noted, by way of anticipation, the obligation to carry out a so-called fundamental rights impact assessment, as provided under article 27 of the AI Act, which, according to paragraph 4, represents a supplementary source to the DPIA under article 35 of the *GDPR*. This assessment covers, among other aspects, the specific risks of harm faced by the affected categories of subjects, as well as a description of the implementation of human oversight, internal governance, and complaint mechanisms.

3.1. Health and safety protections in autonomous and subordinate work contracts: the case of on-demand app workers.

[836] EU-OSHA, "*Psychosocial risk prevention – strategies and legislation-Spain*", in Eu-Osha, 2025, pp. 9-10.
[837] A. ESCUDERO PRIETO, "*El método operativo para integrar la prevención en la coordinación de actividades empresariales*", *cit*., p. 2.

Having laid out the foregoing premises, it should be noted that, within the context of subordinate employment, some scholars have proposed the creation of a distinct category of employment relationship encompassing the specific characteristics of on-demand work mediated via digital applications[838]; in this way, the legislation governing such a special employment relationship should take into account occupational health and safety protections, with risk prevention regulations being adapted, where appropriate, from the provisions set forth in the *LPRL*[839].

Moreover, should on-demand app workers be classified, pursuant to article 1.1 of the *LETA*[840], as self-employed, i.e., individuals who regularly and directly carry out economic activity on their own account, without being subject to the direction of another person and independently of any employment of subordinate workers, the existing legal framework would be insufficient in terms of risk prevention, with negative repercussions for employment quality and an increase in job insecurity[841].

In general, it should be observed that article 5, letter b) of the *LETA* imposes upon self-employed workers the obligation to "comply with occupational health and safety regulations provided by law or by concluded contracts, as well as collective workplace rules," although it does not specify which particular regulations are to be referred to[842].

Based on this obligation, article 8 of the LETA represents an important specific reference regarding risk prevention for self-employed workers in the legal system[843], albeit without constituting a comprehensive regulatory framework on the subject[844].

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838 E. DAGNINO, "*Uber law: perspectiva jurídico-laboral de la sharing/on-de mand economy*", in Revista Internacional y Comparada de Relaciones Laborales y Derecho del Empleo, 2015, vol. 3, núm. 3, p. 28; A. TODOLI' SIGNES, "*El impacto de la «Uber economy» en las relaciones lab orales: los efectos de las plataformas virtuales en el contrato de trabajo*", in Iuslabor, 2015, núm. 3, p. 24.

839 E. RODRIGUEZ, "*Prevención de riesgos laborales en el ámbito de la economía collaborativa*", in Alfonso Sánchez, Rosalía y Valero Torri jos, Juan (Dirs.), Retos jurídicos de la economía colaborativa en el contexto digital, Cizur Menor, Thomson Reuters Aranzadi, 2018, p. 506.

840 Article 1 of the TRLET (Workers' Statute Law), entitled "*Scope of Application*", paragraph 1, states that: "*This law applies to workers who voluntarily perform remunerated services on behalf of another person and within the organisation and management of another individual or legal entity, hereinafter referred to as the employer or entrepreneur*", in Boletin Oficial de Estado. Furthermore, article 1 of the LETA, entitled "*Included Cases*", paragraph 1, provides that: "*This law applies to natural persons who habitually, personally, directly, on their own account and outside the direction and organisation of others, engage in an economic or professional activity for profit, including the provision of work to employees. This provision shall also apply to work regularly performed by the relatives of the persons defined in the preceding paragraph who do not qualify as employees, pursuant to Article 1.3.e) of the consolidated text approved by Royal Legislative Decree 2/2015 of 23 October*", available at Boletin Oficial de Estado.

841 J. A., FERNANDEZ AVILEZ et al., "*NTIC y riesgos psicosociales en el trabajo: es tado de situación y propuestas de mejora*", in DSL, 2017, núm. 2, p. 108; E. RODRIGUEZ, "*Prevención de riesgos laborales en el ámbito de la economía collaborativa*", *cit*., p. 507.

842 E. RODRIGUEZ, "*Prevención de riesgos laborales en el ámbito de la economía collaborativa*", *cit*., p. 513.

843 J. A. FERNANDEZ AVILEZ et al., "*NTIC y riesgos psicosociales en el trabajo: es tado de situación y propuestas de mejora*", *cit*., p. 108.

This article gives rise to a series of interconnected legal consequences[845].

On the one hand, Public Administrations are encouraged to play an active role by promoting prevention, monitoring compliance with regulations, and providing specific training tailored to self-employed workers. It is also provided that, where both self-employed workers and employees of other companies operate in the same workplace, or where self-employed individuals work within corporate facilities, the duties of cooperation, information, and training set out in article 24 of the *LPRL* are universally applicable. On the other hand, companies are required to ensure compliance with risk prevention legislation even when assigning tasks or services to self-employed workers within their premises. Indeed, in cases where self-employed workers make use of equipment supplied by the company for which they provide services, there is a corresponding obligation to provide information.

Lastly, the article recognises the self-employed worker's right to cease their activity and leave the workplace whenever they perceive a serious and imminent risk to their health.

The twelfth additional provision of the *LETA* makes brief reference to the possibility for self-employed workers to participate in training and information programmes on risk prevention, with the aim of reducing workplace accidents and preventing occupational diseases across various sectors.

To this end, representative trade associations, trade unions, and employer organisations are authorised to promote ongoing information and training programmes for this group, supported by the competent Public Administrations responsible for the prevention and management of the consequences of accidents and occupational diseases[846].

Furthermore, it should be emphasised that the *LETA* does not explicitly include obligations relating to risk assessment, planning, and management of prevention measures, which are, however, essential for effective protection[847].

Regarding the application of risk prevention legislation to self-employment, it should be recalled that, according to the additional provision of the *TRLET*, "*self-employment is not subject to labour legislation, except where expressly provided*".

Thus, an "*exceptional and partial legal regime for self-employment is established, limiting the application of labour law only to cases expressly stipulated by the legislator*"[848].

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[844] E. RODRIGUEZ, "*Prevención de riesgos laborales en el ámbito de la economía collaborativa*", *cit.*, p. 514.
[845] M.C. PALOMEQUE LOPEZ, "*Autonomos y seguridad social: la prevencion de riesgos en el trabajo por cuenta propia*", in Seguridad y medio ambiente, 2008, n. 109, p. 22.
[846] J. A. FERNANDEZ AVILEZ et al., "*NTIC y riesgos psicosociales en el trabajo: es tado de situación y propuestas de mejora*", *cit.*, p. 68.
[847] E. RODRIGUEZ, "*Prevención de riesgos laborales en el ámbito de la economía collaborativa*", *cit.*, p. 517.

3.2. The challenge of ensuring occupational health and safety in on-demand app work: regulatory gaps and the need for adaptation in the gig economy.

Building upon this foundation, article 3.1 of the LPRL refers to self-employed workers as potential holders of rights and subjects of obligations in the field of occupational risk prevention. Broadly speaking, the inclusion of self-employed workers within the scope of occupational risk prevention legislation responds to the need to protect all workers operating in this sector, irrespective of the contractual arrangement under which they perform their activities[849].

However, it should be emphasised that the reference to self-employed workers in the LPRL is marginal, general, and imprecise, as the text does not clearly define the circumstances in which such workers should be recipients of rights and obligations[850].

In this regard, the formulation of article 3.1 of the *LPRL* ("*the rights and duties that may arise for self-employed workers*") implies that occupational health and safety rights and obligations apply to self-employed workers only when expressly indicated[851], and therefore it may be concluded that the provision does not establish a general right for self-employed workers to health and safety protection in the performance of their professional activities. Specifically, the *LPRL* makes explicit reference to self-employed workers in article 24, which mentions self-employed workers in the context of rights and duties concerning the coordination of business activities, an aspect also regulated by Royal Decree 171/2004 of 30 January, which implements article 24 of Law 31/1995 of 8 November on the Prevention of Occupational Risks, in relation to the coordination of business activities.

It appears to be precisely in this article that the rights and duties of self-employed workers are included, albeit limited to the context of business activity coordination.

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[848] M. C. PALOMEQUE LOPEZ, "*Autonomos y seguridad social: la prevencion de riesgos en el trabajo por cuenta propia*", *cit*., p. 21.

[849] A. MONTOYA MELGAR, "*Trabajo dependiente y trabajo autónomo ante el Derecho del Trabajo*", in Temas laborales: revista andaluza de trabajo y bienestar social, 2005, núm. 81, p. 33.

[850] S. GONZALEZ ORTEGA, "*El tratamiento de los riesgos del trabajo de los tra bajadores autónomos*", in Temas laborales: revista andaluza de trabajo y bienestar social, 2005, núm. 81, p. 150.

[851] S. GONZALEZ ORTEGA, "*El tratamiento de los riesgos del trabajo de los tra bajadores autónomos*", *cit*., p. 151.

In this respect, and in relation to on-demand work via applications, the issue arises of the level of coordination that must be ensured by companies operating digital work platforms in respect of "*their self-employed workers*"[852].

In particular, it is essential to ascertain whether such companies may fall under paragraph two of article 24 of the *LPRL*, which governs the presence of workers from different companies in a workplace under the responsibility of a single employer, as well as paragraph three of the same article, which provides for the presence of workers from different companies in a work centre when a principal employer exists[853].

The first challenge in addressing this issue lies in the absence, in on-demand work via applications, of a common workplace where professional activities are carried out and where risks are transmitted.

Pursuant to article 2(a) of Royal Decree 171/2004 of 30 January, "*workplace*" is defined as "*any area, whether built or not, in which workers are required to remain or to which they must have access for work purposes*"[854].

Although this notion is based on a traditional enterprise model, it must be noted that on-demand work via applications does not have, as is already known, a specific physical workplace[855], and it may therefore be concluded that this form of work does not satisfy one of the requirements established by the legislation.

This position is further supported by the European Commission in its Communication to the European Parliament, the Council, the European Economic and Social Committee, and the Committee of the Regions on "*Safer and Healthier Work for All: Modernising EU Legislation and Policies on Occupational Safety and Health*", dated 10 January 2017, where it is explicitly stated that new forms of work necessitate a decidedly more dynamic conception of the "*workplace*".

In this regard, it may be argued that, in the context of work carried out via apps, the digital platform shared between the company and the self-employed workers constitutes the common workplace, notwithstanding the greater difficulties in applying this expansive interpretation, given that the activity does not occur within a physical setting[856].

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[852] H. ALVAREZ CUESTA, "*La gig economy y la obligación de coordinar la seguridad y salud de sus "autónomos'"*", in Revista Jurídica de la Universidad de León, 2018, núm. 5, p. 91.

[853] R. AGUILERA IZQUIERDO, "*El desarrollo reglamentario del art. 24 de la LPRL: la coordinación de actividades empresariales*", in Revista del Ministerio de Trabajo y Asun tos Sociales, 2004, núm. 53, p. 280.

[854] Si veda in Boletin Oficial de Estado.

[855] J. A. FERNANDEZ AVILES et al., "*NTIC y riesgos psicosociales en el trabajo: es tado de situación y propuestas de mejora*", *cit*., p. 117.

[856] H. ALVAREZ CUESTA, "*La gig economy y la obligación de coordinar la seguridad y salud de sus "autónomos'"*", *cit*., pp. 91-92.

A second challenge concerns the meaning of the expressions "*employer with legal ownership*" and "*principal employer*".

According to article 2 of Royal Decree 171/2004, the employer with legal ownership is "*the person who has the ability to provide and manage the workplace*", whereas the principal employer is "*the employer who concludes contracts or subcontracts for the execution of works or services relating to their own activity, carried out at their own workplace*". In such cases, in order to include the platform economy within the scope of article 24 of the *LPRL*, it becomes necessary to consider the network in general, including the digital platform, as the workplace.

With regard to the possible presence of workers from different companies at a workplace managed by a single employer, the company must inform the self-employed workers, who in turn have a duty to communicate with one another and notify the employer.

Concerning the second case, article 24.3 of the *LPRL* provides that "*companies that conclude contracts or subcontracts with other companies for the execution of works or services relating to their own activity, carried out at their own workplace, must monitor compliance with occupational risk prevention regulations by contractors and subcontractors*". In the context of the platform economy, the technology company should, therefore, assume the responsibility for oversight and monitoring in order to ensure the requisite levels of safety.

However, the primary difficulty in extending such comprehensive coordination to the gig economy lies in the fact that references to contracting and subcontracting companies must be interpreted as applying to self-employed workers, with the well-known challenges associated with enforcing preventative regulations[857].

In conclusion, the legal classification of service providers as employees entails the application of the LPRL and its implementing regulations, imposing upon the employer the duty to protect workers effectively from occupational risks.

The rationale for this requirement lies in the respect for and the practical implementation of the fundamental right to life and physical and moral integrity, as well as the right to health protection, as enshrined, as previously noted, in article 15 of the Spanish Constitution[858].

4. *Occupational health and safety in the United Kingdom: challenges, legislation, and the evolution of risks in contemporary work.*

[857] H. ALVAREZ CUESTA, "*La gig economy y la obligación de coordinar la seguridad y salud de sus "autónomos'"*", *cit*., pp. 92-95.

[858] E. RODRIGUEZ, "*Prevención de riesgos laborales en el ámbito de la economía collaborativa*", *cit*., p. 512.

Issues concerning occupational health, safety, and wellbeing represent matters of significant contemporary interest and are frequently the subject of debate within the United Kingdom. The legislative framework governing occupational health and safety in the United Kingdom is notably complex, comprising a combination of statutory regulations and common law principles, which historically incorporated requirements derived from European Union legislation[859].

It should, however, be noted that the health and safety regulatory framework has been affected by the decision to withdraw from the European Union following the 2016 referendum.

Firstly, it is important to recall that the United Kingdom acceded to the then European Economic Community in 1973, a decision subsequently endorsed by a referendum held in 1975. This development effectively bound the United Kingdom to transpose all directives and regulations adopted by the European Parliament and the Council of the European Union.

While EU directives operated similarly to the *Health and Safety at Work Act*, insofar as they set objectives but allowed individual Member States a degree of discretion in achieving them, European regulations were, conversely, directly applicable and binding in their entirety across the Union.

In June 1989, with the entry into force of the aforementioned *European Framework Directive on Occupational Health and Safety* (EEC/391/1989), the United Kingdom adopted the so-called "*six-pack*" of health and safety regulations in 1992, comprising the Health and Safety (Display Screen Equipment) Regulations, the *Manual Handling Operations Regulations*, the *Personal Protective Equipment at Work Regulations*, the *Workplace (Health, Safety and Welfare) Regulations*, the *Provision and Use of Work Equipment Regulations* 1998 (*PUWER*), and the *Management of Health and Safety at Work Regulations* 1999.

It follows that, from 1992 until January 2020, any legislative measure concerning health and safety enacted in the United Kingdom was adopted pursuant to European law, meaning that, in general terms, standards could not be lowered without risk of challenge or sanction by the EU.

From 1 February 2020, with the full implementation of Brexit, the Secretary of State for Work and Pensions acquired the authority to determine the appropriateness of enacting health and safety regulations. While the *Health and Safety at Work Act* requires full parliamentary

[859] D. BENNETT, "*Munkman on Employer's Liability*", 16th edition, London/Butterworths, 2013.

approval to be repealed, statutory regulations can be more readily removed. Indeed, one of the so-called "*benefits of Brexit*" has been the perceived ability to eliminate laws from the domestic legal order without the threat of reprisal from the EU.

Indeed, the Conservative government of the United Kingdom introduced the *Retained EU Law (Revocation and Reform) Bill* 2023, the objective of which was to remove large portions of law from the domestic legal order, including those relating to occupational health and safety, through so-called "*sunset clauses*" that would have resulted in the automatic expiry of the legislation by the end of 2023.

However, although the Bill received Royal Assent and came into force in June 2023, it should be noted that most health and safety regulations were not included, owing to a heated parliamentary debate. This ultimately led the government to abandon the automatic repeal approach, although 38 regulations, some of which were largely obsolete, were nevertheless revoked in the field of health and safety[860].

This experience has demonstrated that health and safety regulations in the United Kingdom are now characterised by a particular vulnerability, accompanied by the possibility that the country may gradually diverge from European and international standards, potentially weakening its levels of protection relative to other states.

With this brief context in mind, the primary legislative source remains the *Health and Safety at Work etc. Act* 1974 (*HSW*), whose section 2 establishes the general duties that employers owe to their employees. Other sections (notably sections 3 to 7) set out additional obligations, such as those of employers and self-employed persons towards third parties, of persons responsible for non-domestic premises, of designers, manufacturers, importers, or suppliers of work equipment and substances, as well as the duties of employees themselves in relation to health and safety.

Supporting this legislation is an extensive body of regulations and approved codes of practice (so-called *ACOP*s), which address specific aspects of occupational health and safety. The *Health and Safety Executive* (*HSE*) or other competent authorities supervise and enforce these provisions through improvement or prohibition notices, with recourse to criminal proceedings in the most serious cases[861].

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[860] L. ATKINSON, "*Online Safety Act 2023: Repeal*", in UK Parliament, 2025; DEPARTMENT FOR SCIENCE, INNOVATION AND TECHNOLOGY, "*Online Safety Act: explainer*", in Gov.Uk, 2025.

[861] By way of example, it can be noted that local government authorities (or local councils) are responsible for the enforcement of regulations relating to shops and offices within their respective areas. Overall, the HSE and other local authorities are required to enforce around 90 such regulations, the full list of which is available at http://www.hse.gov.uk/legislation/statinstruments.htm.

As regards workers who suffer occupational injuries, whether physical or psychological, the principal recourse today is, in most cases, a civil claim for damages before the civil courts[862]. Such an action centres on demonstrating that the employer breached the duty of reasonable care owed to the health and safety of employees.

In certain circumstances, claims may also be brought for psychiatric harm, relying on the alleged breach by the employer of an implied contractual duty under common law.

This duty requires that the employer does not engage in conduct that, without just cause, undermines the trust necessary to maintain the employment relationship, as implicitly envisaged by the contract[863].

In the past, employees could also initiate separate civil actions for breaches of statutory duties contained in the regulations, although this possibility has been largely abolished in response to strong criticism. This body of data and the related legislative framework clearly illustrate the challenges the United Kingdom faces in effectively ensuring occupational health and safety, particularly in an ever-evolving work environment.

Continuing with legislative measures designed to safeguard health and safety, it should be noted that the European Framework Directive on health and safety was primarily transposed in the UK through the *Management of Health and Safety at Work Regulations* 1999 (*MHSW*)[864].

Firstly, according to the article 3, employers are required to carry out a suitable and sufficient risk assessment, with the objective of identifying the preventive and protective measures necessary to comply with legal obligations. For businesses with more than five employees, for instance, it is mandatory to record the most significant findings of these assessments, as well as to identify groups of workers who may be particularly at risk.

Moreover, these assessments must be reviewed if there is reason to suspect they may be invalid, or in cases of significant changes in the working conditions to which they relate.

Another key element is the obligation to provide employees with clear and relevant information regarding the identified risks, the preventive measures adopted, and the procedures to follow in situations of serious and imminent danger.

In addition, according to the article 10, workers must receive adequate training in health and safety, both at the time of hiring and whenever they face new risks, for example due to a

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[862] This responsibility arises both within the context of civil liability (i.e., *tort*) for negligence and as an implicit, parallel term within the employment contract.

[863] R. M. WALDEN, "*Employer Cilvil Liability for Work-related Psychiatric Injury: Juggling Established Principles and "New" Risks'*", in EBLR, 2013, 34/3, pp.84-94.

[864] SI 1999/3242. These provisions revoked and replaced the original 1992 regulations of the same name.

transfer or a change in responsibilities. This duty also applies in the event of the introduction of new technologies, equipment, or work systems in the workplace[865].

Ultimately, it should be emphasised that the regulations require employers to adopt and implement organisational measures appropriate to the nature of the activities carried out and the size of the business, in order to plan, control, monitor, and review effectively the preventive and protective measures in place.

These measures, it should be noted, must be guided by the general principles of prevention outlined in Annex 1 of the *MHSW*, which serve as the reference framework to ensure a safe and healthy working environment[866].

4.1. Management of psychosocial risks and worker protection in the algorithmic era: benefits and limits of the UK regulatory framework.

Analysing in greater detail the regulatory framework on health and safety at work in the United Kingdom, it is necessary, first of all, to clarify that it provides a combination of duties based on "means" and others aimed directly at "outcomes".

The former, laid down in section 2 of the *Health and Safety at Work Act* (*HSW*), include the principle of so-called "*reasonably practicable*" measures.

Specifically, according to section 2 (para. 1) of this *Act*, employers have a duty to ensure, so far as is reasonably practicable, the health, safety and welfare of their employees at work. This general duty is manifested in the requirement to provide, as far as possible, a safe system of work, adequate information, instruction, training and supervision to protect workers' health, as well as to create and maintain a safe working environment, free from risks to health, and equipped with suitable facilities to ensure employees' welfare.

The concept of "*reasonably practicable*" above requires a balance between the level of risk to employees and the "cost" of the measures necessary to eliminate or reduce it, which may include time, effort or financial resources[867].

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[865] *The Management of Health and Safety at Work Regulations 1999*, in The Management of Health and Safety at Work Regulations 1999.

[866] These are: (a)avoiding risks; (b)evaluating the risks which cannot be avoided; (c)combating the risks at source; (d)adapting the work to the individual, especially as regards the design of workplaces, the choice of work equipment and the choice of working and production methods, with a view, in particular, to alleviating monotonous work and work at a predetermined work-rate and to reducing their effect on health; (e)adapting to technical progress; (f)replacing the dangerous by the non-dangerous or the less dangerous; (g)developing a coherent overall prevention policy which covers technology, organisation of work, working conditions, social relationships and the influence of factors relating to the working environment; (h)giving collective protective measures priority over individual protective measures; and (i)giving appropriate instructions to employees.

However, some regulations impose mandatory duties that entail a form of strict liability, approaching the concept of "*outcome-based*" duties, often signalled by terms such as "must ensure" or "must provide", as exemplified in the provisions of the *Management of Health and Safety at Work Regulations* (*MHSW*)[868].

These Regulations, in particular, stipulate that employers must appoint one or more "qualified" persons who, having appropriate training, experience, knowledge and other qualities enabling them to implement effectively the necessary preventative measures, may come from within or outside the organisation, to assist in managing the measures required to comply with the law. Furthermore, the number of competent persons must be proportionate to the size of the organisation, the risks to workers and the distribution of those risks across the different activities of the business, and the employer must ensure effective cooperation among the appointed persons.

With regard to psychosocial risks, also present in work carried out via digital platforms, it should be noted that, firstly, there are no specific provisions in the United Kingdom that explicitly address psychiatric, psychosocial or similar stress factors within the health and safety regulatory framework.

Nevertheless, section 2 of the *Health and Safety at Work Act* (*HSW*), which establishes the general duty of employers to ensure, so far as reasonably practicable, the health, safety and welfare of their employees at work, clearly applies both to mental or psychiatric health and to the physical wellbeing of workers.

This is further evidenced by the definition of "*personal injury*" contained in the *HSW Act*, which explicitly includes, in section 53, "*any disease and any impairment of the physical or mental condition of a person*".

Secondly, it can be stated that the obligations of employers under the *Management of Health and Safety at Work Regulations (MHSW)***,** which require adequate and sufficient assessments of the health and safety risks to which employees are exposed while performing their work, also include risks to psychiatric and psychological well-being.

In this regard, according to a scholar, "*in fact, there have been a few rare cases over the past (approximately 15) years in which regulatory authorities initiated the first phase of*

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[867] Per Lord Asquith in Edwards v National Coal Board [1949] KB 704 at p.712. In Commission of the European Communities v UK [2007] IRLR 720, the European Court of Justice ruled that the qualification of "*reasonable practicability*" in s.2(1) of the HSW does not infringe the general "*duty to ensure the safety and health of workers in every aspect related to work*" set out in Article 5(1) of the Framework Directive.

[868] Other mandatory duties also exist in other sets of Regulations. See, for example, reg.5(1) of the "Provision and Use of Work Equipment Regulations" of 1998 provides that: "*Every employer shall ensure that work equipment is maintained in an efficient state, in efficient working order and in good repair*".

enforcement, issuing improvement notices to employers, requesting, for example, the performance of 'adequate and sufficient risk assessments regarding employee health and safety risks related to work stress factors.' One case concerned shift fatigue for staff working at an airport check-in desk"[869].

Even so, as early as 2000, regulatory and enforcement authorities concluded that uncertainties surrounding enforcement mechanisms made a more explicit regulatory approach highly difficult, opting instead for a more voluntary approach, focused on so-called "*management standards*" for workplace stress[870].

In this context, the *UK General Data Protection Regulation (UKGDPR)* imposes on employers the obligation to comply with fundamental principles such as lawfulness, transparency, and data minimisation[871], which should essentially limit risks associated with algorithmic management.

Nonetheless, it can be noted that the low awareness and application of these rules only increases the risk of violations, especially with the use of technologies developed in countries with less stringent standards.

An important measure under the *UKGDPR* is the obligation on employers to conduct, for preventive purposes, risk impact assessments regarding data processing[872], particularly when

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[869] R. M. WALDEN, "*Employer Cilvil Liability for Work-related Psychiatric Injury: Juggling Established Principles and "New" Risks'*", *cit*., p. 90.

[870] C. J. MACKAY et. al., *"Management Standards' and work-related stress in the UK: policy background and science*, *Work & Stress"*, 2004, 18/2, 91, p. 92.

[871] See article 5 of the UKGDPR, in Gov.Uk.

[872] Article 35 of the UKGDPR, entitled "*Data protection impact assessment*", states that: "*1.Where a type of processing in particular using new technologies, and taking into account the nature, scope, context and purposes of the processing, is likely to result in a high risk to the rights and freedoms of natural persons, the controller shall, prior to the processing, carry out an assessment of the impact of the envisaged processing operations on the protection of personal data. A single assessment may address a set of similar processing operations that present similar high risks. 2.The controller shall seek the advice of the data protection officer, where designated, when carrying out a data protection impact assessment. 3.A data protection impact assessment referred to in paragraph 1 shall in particular be required in the case of: (a)a systematic and extensive evaluation of personal aspects relating to natural persons which is based on automated processing, including profiling, and on which decisions are based that produce legal effects concerning the natural person or similarly significantly affect the natural person; (b)processing on a large scale of special categories of data referred to in Article 9(1), or of personal data relating to criminal convictions and offences referred to in Article 10; or (c)a systematic monitoring of a publicly accessible area on a large scale. 4.The Commissioner shall establish and make public a list of the kind of processing operations which are subject to the requirement for a data protection impact assessment pursuant to paragraph. The Commissioner may also establish and make public a list of the kind of processing operations for which no data protection impact assessment is required. The assessment shall contain at least: (a)a systematic description of the envisaged processing operations and the purposes of the processing, including, where applicable, the legitimate interest pursued by the controller; (b)an assessment of the necessity and proportionality of the processing operations in relation to the purposes; (c)an assessment of the risks to the rights and freedoms of data subjects referred to in paragraph 1; and (d)the measures envisaged to address the risks, including safeguards, security measures and mechanisms to ensure the protection of personal data and to demonstrate compliance with this Regulation taking into account the rights and legitimate interests of data subjects and other persons concerned. 8.Compliance with approved codes of conduct referred to in Article 40 by the relevant controllers or processors shall be taken into due account in assessing the impact of the processing*

it is used to monitor, control, or evaluate employee performance[873], even though there is no explicit involvement of employees or unions in these assessments, nor their publication, thereby reducing opportunities to prevent abuse[874].

Employees, on the other hand, have significant rights to prevent risks, such as the right under article 15 of the aforementioned law[875] to access their data and obtain information on automated decisions concerning them, as well as the right to object to decisions made solely through automation.

However, it can be noted that many organizations circumvent these obligations, for example by implementing superficial human oversight or avoiding decisions with legally significant effects, making protections largely ineffective[876].

Another important right for employees is provided by article 22 of the *UKGDPR*[877] and Section 14 of the *Data Protection Act* 2018, which aim to ensure employees are not subject to

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operations performed by such controllers or processors, in particular for the purposes of a data protection impact assessment. 9.Where appropriate, the controller shall seek the views of data subjects or their representatives on the intended processing, without prejudice to the protection of commercial or public interests or the security of processing operations. In the case of processing pursuant to point (c) or (e) of Article 6(1), paragraphs 1 to 7 of this Article do not apply if a data protection impact assessment has already been carried out for the processing as part of a general impact assessment required by domestic law, unless domestic law provides otherwise. 11.Where necessary, the controller shall carry out a review to assess if processing is performed in accordance with the data protection impact assessment at least when there is a change of the risk represented by processing operations", in Gov.Uk.

[873] Information Commissioner's Office, Accountability and Governance. *Data Protection Impact Assessments*, ICO, 2018.

[874] J. ATKINSON, P. COLLINS, "*Worker Voice and Algorithmic Management in Post Brexit Britain*", in Sage Journals, 2023, n. 39.

[875] Article 15 of UKGDPR, entitled "*Right of access by the data subject*", establishes that:: "*1.The data subject shall have the right to obtain from the controller confirmation as to whether or not personal data concerning him or her are being processed, and, where that is the case, access to the personal data and the following information: (a)the purposes of the processing; (b)the categories of personal data concerned; (c)the recipients or categories of recipient to whom the personal data have been or will be disclosed, in particular recipients in third countries or international organisations; (d)where possible, the envisaged period for which the personal data will be stored, or, if not possible, the criteria used to determine that period; (e)the existence of the right to request from the controller rectification or erasure of personal data or restriction of processing of personal data concerning the data subject or to object to such processing; (f)the right to lodge a complaint with the Commissioner; (g)where the personal data are not collected from the data subject, any available information as to their source; (h)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. 2.Where personal data are transferred to a third country or to an international organisation, the data subject shall have the right to be informed of the appropriate safeguards pursuant to Article 46 relating to the transfer. 3.The controller shall provide a copy of the personal data undergoing processing. For any further copies requested by the data subject, the controller may charge a reasonable fee based on administrative costs. Where the data subject makes the request by electronic means, and unless otherwise requested by the data subject, the information shall be provided in a commonly used electronic form. 4.The right to obtain a copy referred to in paragraph 3 shall not adversely affect the rights and freedoms of others*", in Gov.Uk.

[876] J. L. LEWIS et al, "*Managing legal risk in the age of artificial intelligence: what key stakeholders need to know today*", in Whilmerhale, 2026; S. BIRAHIM, "*Contesting the algorithm: advancing a right to challenge AI decisions under the GDPR for algorithmic fairness*", in Transforming government: people, process and policy, Emerald Publishing, 2025, 19(4), pp. 895-913.

decisions based solely on automated processes, except in limited circumstances; this includes the right to be informed about the use of such processes and to request a human review of decisions[878].

This right is designed, as mentioned, to protect employees from the risks arising from highly invasive and constant control and monitoring, which characterizes the operation of digital platforms; this is explained by the complexity and opacity regarding the functioning of these technological tools[879].

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[877] Article 22 of the UKGDPR, entitled "*Automated individual decision-making, including profiling*", establishes that: "1.*The data subject shall have the right not to be subject to a decision based solely on automated processing, including profiling, which produces legal effects concerning him or her or similarly significantly affects him or her. Paragraph 1 shall not apply if the decision: is necessary for entering into, or performance of, a contract between the data subject and a data controller; is required or authorised by domestic law which also lays down suitable measures to safeguard the data subject's rights and freedoms and legitimate interests; or is based on the data subject's explicit consent. In the cases referred to in points (a) and (c) of paragraph 2, 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.*
Section 14 of the 2018 Act, and regulations under that section, make provision to safeguard data subjects' rights, freedoms and legitimate interests in cases that fall within point (b) of paragraph 2 (but not within point (a) or (c) of that paragraph). Decisions referred to in paragraph 2 shall not be based on special categories of personal data referred to in Article 9(1), unless point (a) or (g) of Article 9(2) applies and suitable measures to safeguard the data subject's rights and freedoms and legitimate interests are in place", in Gov.Uk.

[878] See, in this regard, the Section 14 of Data Protection Act 2018, entitled "*Automated decision-making authorised by law: safeguards*", establishes that: "*This section makes provision for the purposes of Article 22(2)(b) of the UK GDPR (exception from Article 22(1) of the UK GDPR for significant decisions based solely on automated processing that are required or authorised under the law of the United Kingdom or a part of the United Kingdom and subject to safeguards for the data subject's rights, freedoms and legitimate interests). A decision is a "significant decision" for the purposes of this section if, in relation to a data subject, it produces legal effects concerning the data subject, or (b)similarly significantly affects the data subject. A decision is a "qualifying significant decision" for the purposes of this section if it is a significant decision in relation to a data subject, (b)it is required or authorised by law, and (c)it does not fall within Article 22(2)(a) or (c) of the UK GDPR (decisions necessary to a contract or made with the data subject's consent). Where a controller takes a qualifying significant decision in relation to a data subject based solely on automated processing, (a)the controller must, as soon as reasonably practicable, notify the data subject in writing that a decision has been taken based solely on automated processing, and (b)the data subject may, before the end of the period of 1 month beginning with receipt of the notification, request the controller to (i)reconsider the decision, or (ii)take a new decision that is not based solely on automated processing. If a request is made to a controller under subsection, the controller must, within the period described in Article 12(3) of the UK GDPR, (a)consider the request, including any information provided by the data subject that is relevant to it, (b)comply with the request, and (c)by notice in writing inform the data subject of the steps taken to comply with the request, and (ii)the outcome of complying with the request. In connection with this section, a controller has the powers and obligations under Article 12 of the UK GDPR (transparency, procedure for extending time for acting on request, fees, manifestly unfounded or excessive requests etc) that apply in connection with Article 22 of the UK GDPR. The Secretary of State may by regulations make such further provision as the Secretary of State considers appropriate to provide suitable measures to safeguard a data subject's rights, freedoms and legitimate interests in connection with the taking of qualifying significant decisions based solely on automated processing. Regulations under subsection, may amend this section, and (b)are subject to the affirmative resolution procedure*", in Gov.Uk.

[879] G. DEL GAMBA, S. LEUCCI, "*Decisioni automatizzate dagli algoritmi: le tutele del Gdpr e le eccezioni*", in Agenda Digitale, 2019.

Despite these rules attempting to offer significant protection against algorithmic management, their practical application is very limited, given their easy circumvention by organizations[880].

Moreover, article 22 applies only to decisions that produce legal effects or other significantly relevant consequences, excluding many algorithmic activities such as shift allocation, payroll calculations, or performance monitoring.

Finally, additional risks arise with the potential approval of the *Data Protection and Digital Information Bill* (No. 2), which could reduce employers' obligations to conduct impact assessments[881] and expand the use of automated decision-making, thereby decreasing protections for workers[882].

It is clear, therefore, that the application of this data protection law presents significant limitations, as protective mechanisms, such as data access requests, are difficult to implement, require technical expertise[883], and the supervisory authority (*ICO*) does not appear to have sufficient resources to ensure adequate oversight, increasing the risk that workers may be subject to discriminatory or unfair algorithmic decisions without effective recourse[884].

Ultimately, given the risks of disengagement, stress, and other mental health issues arising from potential discriminatory practices due to the high opacity that often characterizes algorithmic tools[885], one must also mention the *Equality Act* 2010, which, while attempting to provide a legal basis to counteract discrimination inherent in algorithmic systems, has quite limited effectiveness, especially regarding the prevention of risks associated with algorithmic management.

Specifically, this law prohibits direct discrimination when algorithms treat individuals with protected characteristics, such as race or sex[886], less favorably, and indirect discrimination when such systems place protected groups at a disadvantage without a proportionate justification[887].

Yet, a significant risk is that workers are often unaware that they have been "victims" of a discriminatory system due to the lack of algorithmic transparency.

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[880] See Article 29 Working Party, "*Guidelines on Automated Individual Decision-Making and Profiling for the Purposes of Regulation 2016/679*", 2018, 20.

[881] See Section 18 of the *Data Protection and Digital Informatio (No. 2) Bill*, in UK Parliament.

[882] See Section 17 of the *Data Protection and Digital Informatio (No. 2) Bill*, in UK Parliament.

[883] L. EDWARDS, M. VEALE, "*Slave to the algorithm? Why a 'right to an explaination' is probably not the remedy you are looking for*", in Duke Law Scolarship Repository, 2017, n. 67, p. 49.

[884] ICO's strategic plan, *Information Commissioner's Office, ICO25*, *Empowering You through Information*, *ICO*, 2022.

[885] G. DE SIMONE, "*Lavoro digitale*", in Lavoro digitale, M. NOVELLA, P. TULLINI (a cura di), Giappichelli, Torino, 2023, p. 143.

[886] J. ADAMS-PRASSL, R. BINNS, A. K. LYTH, "*Directly Discriminatory Algorithms*", in The Modern Law Review, 2023, 86, pp. 144–175.

[887] See Section 19 of the *Equality Act* 2010, in Gov.Uk.

Even when suspicions arise, obtaining the necessary evidence to challenge an algorithm is difficult[888], since the core information about its internal functioning is inaccessible; this creates a substantial barrier to identifying and proving systemic discrimination[889].

Moreover, the *Equality Act* protects only against discrimination based on specific characteristics (such as sex or ethnicity), excluding risks associated with new forms of algorithmic categorization; for example, algorithms may legally discriminate based on social class, online behaviors[890], or other criteria not protected by law.

To mitigate such risks, it is crucial to increase algorithmic transparency, improve workers' access to information, and expand legal protections.

However, the current legislative framework does not facilitate achieving these objectives, leaving substantial room for systematic discrimination and injustice[891].

4.2. The artificial intelligence (employment and regulation) bill: a step toward responsible AI regulation in the workplace.

To address the gaps in the existing UK legislation on health and safety, data protection, and algorithmic discrimination (*Equality Act* 2010, *UK GDPR*, and *HSW Act*), and given the lack of specific provisions regarding AI in workplace decision-making[892], the *Trade Union Congress* (TUC) has proposed the *Artificial Intelligence (Employment and Regulation) Bill*. This bill aims to translate fundamental principles such as consultation, transparency, explainability, and equality into concrete rights for workers and clear obligations for employers, focusing particularly on "*high-risk*" decisions that may produce legal effects or significant consequences.

As part of a four-year *TUC* project on the use of AI in employment, conducted by the *TUC AI Working Group*[893], the impact of algorithmic management was examined, a manifesto for change was published, and guidelines for union representatives were provided. A central aspect of the bill concerns transparency and risk prevention: employers are required to

[888] See Section 136 of *Equality Act* 2010, in Gov.Uk, *Royal Mail Group Ltd v Efobi*, 2021, UKSC 33.
[889] A. KELLY-LYTH, "*Algorithmic Discrimination at Work*", in ELLJ, 2023, 14, p. 152.
[890] See Grainger plc v Nicholson, 2010, IRLR 4 (EAT).
[891] S. WATCHER, "*The Theory of Artifical Immutability: Protecting Algorithmic Groups Under Anti-Discrimination Law*", in TULR, 2023, p. 97.
[892] The project was also inspired by a Private Member's Bill on AI and Employment sponsored by Mick Whitley MP and based on the *TUC*'s AI manifesto, in Uk Parliament (Parliamentary Bills).
[893] The *TUC AI Working Group* has representatives from 21 affiliate TUC unions, led by TUC policy officer Mary Towers.

conduct a thorough assessment of AI-related risks both before and after the introduction of systems, with mandatory annual reviews.

This assessment, known as WAIRA (*Workplace AI Risk Assessment*), would be a prerequisite for implementing high-risk decisions. The initial WAIRA requires a detailed description of the AI system, the value chain involved, the expected launch date, and the categories of high-risk decisions for which the system will be deployed.

Furthermore, employers would provide clarifications regarding the purpose of adopting the AI system, the logic underlying its decision-making process, the data that will be used, and the manner in which the data (including workers' personal data) will impact decisions. Employers would required to describe how the accuracy of the systems will be monitored, specifying the metrics to be used and the measures designed to ensure that the AI does not pose risks to workers' rights as guaranteed under UK health and safety law, human rights, equality law, and data protection legislation. Finally, the assessment must include an analysis of actual risks and the measures planned to mitigate or eliminate them.

It should be noted that the WAIRA obligation is not limited to its initial phase.

Once AI systems are deployed in high-risk decision-making, employers are required to repeat the WAIRA at least annually. These subsequent assessments are not mere repetitions of the initial elements; rather, they are intended to evaluate the actual effects of decisions made, for example, in relation to protected characteristics under the *Equality Act* 2010, assessing how the system generated inaccurate decisions, how often these were corrected, and the extent to which these decision-making processes caused harm in the workplace[894]. This process, particularly regarding high-risk systems, also includes consultation with workers and unions, who have the right to be involved before high-risk AI systems are adopted. Employers must consider workers' concerns and interests through consultations held at least one month in advance, ensuring these concerns are addressed comprehensively and legitimately.

This entails minimizing the use of potentially harmful or high-risk AI systems, mitigating their impact on workers' well-being, and safeguarding the human dimension of the employment relationship.

To ensure the effectiveness of this consultation, employers would have several specific obligations. First, after preparing a WAIRA, they would share the document with employees

[894] Moreover, the Secretary of State, in this context, is tasked with issuing binding guidance regarding the form and content that WAIRAs must take, which may involve allowing for differences in requirements depending on circumstances, such as the size of the business. Before issuing such guidance, the Secretary is required to consult representative stakeholders, including trade associations, trade unions, the *Equality and Human Rights Commission*, the *Information Commissioner's Office*, and other parties deemed appropriate to represent workers' interests.

and workers to gather their feedback, discuss concerns, and identify ways to remove or mitigate any adverse effects. Once the high-risk decision-making process has commenced, this cycle of assessment and consultation must be repeated every twelve months for as long as the process continues[895].

Moreover, the bill would require employers to maintain a public register of AI systems used and to provide each worker or candidate with a personalized statement explaining how AI has influenced decisions affecting them. Workers also have the right to request a human review of any decisions made by AI.

Specifically, the legislation stipulates that, upon request by an employee, worker, or candidate, employers are obliged to provide a clear, accessible, free, and written explanation in a usable format regarding any high-risk decision affecting them and potentially producing adverse consequences.

Such an obligation arises, it can be noted, when the individual submits a written request within three months from the moment they become aware of the decision, unless otherwise agreed between the parties or another timeframe is deemed fair; once the request is submitted, the employer is required to provide the explanation within 28 days, or within another agreed or reasonably determined period[896].

Moreover, upon request by an employee, worker, or candidate for a position, the employer must ensure a personal review of high-risk decisions that may have negative effects on that individual. This review must be conducted by a competent agent, i.e., a person specifically designated within the organization.

It can be emphasized that this right can be exercised if the individual submits a written request within six months from becoming aware of the decision, unless the parties agree on a longer period or such an extension is considered fair.

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[895] It should be noted that, once again, the Secretary of State is responsible for providing operational guidance on how employers must conduct this process, establishing guidelines that may vary according to sectors and levels of risk considered. Before issuing these guidelines, the Secretary must consult with various social actors, including trade associations, trade unions, and other parties deemed suitable to represent the interests of workers.

[896] However, there are exceptions, for example where an employer may not be required to provide such explanations if it is not reasonably practicable, such as when the decision has already been personally reviewed, or if the request merely duplicates another already considered within the previous three months, or if it is deemed vexatious or excessive. The burden of proof for the last scenario lies with the employer, taking into account factors such as the frequency of requests, the time elapsed since the last request, and the degree of overlap with other previously submitted requests. To ensure clarity and transparency, every employer is required to appoint a competent officer responsible for providing these explanations; if this officer is not formally designated, the responsibility falls on the most senior person within the organization. It is also mandatory to make the name, contact details, and address of the designated officer easily accessible to all employees and candidates. Lastly, the Secretary of State has the power to issue regulations to further define what is meant by "reasonably practicable," the essential contents of an explanation, and the acceptable and accessible formats. These provisions may vary depending on the circumstances or different work situations.

In this case, the competent agent would be formally appointed by the employer, and their contact details must be made accessible to all workers and candidates. In the absence of such an appointment, responsibility falls to the most senior person within the organization.

The suitability for this role must be verified following adequate training, so that the agent is capable of discussing and clarifying the facts and circumstances leading to the contested decision and, if necessary, modifying it.

The review should generally take place within 28 days of the request.

Employers may allow the competent agent to delegate this function, but only to individuals who meet the same qualification requirements[897].

A key measure concerns the prohibition of emotion recognition technologies that could harm workers' health, thereby protecting them from invasive or damaging practices affecting their physical and psychological integrity.

Another crucial point, in terms of prevention, involves combating discriminatory algorithms, to ensure that AI does not perpetuate inequalities or make discriminatory decisions; for this reason, the bill, which amends the aforementioned Equality Act 2010, introduces a reversal of the burden of proof, simplifying the demonstration of potential AI-related discrimination. Employers can defend themselves only by showing that they carried out adequate checks to prevent discrimination.

In this regard, *Section 109 of the Equality Act*, as amended by this bill, establishes that any decision made through AI systems, initiated by an employer or commissioner, will be considered as made by the employer or commissioner themselves.

To support these provisions, the *Equality and Human Rights Commission* (EHRC) will be tasked with publishing and regularly updating certain guidelines to assist employers in complying with the regulations.

To address the issue of work intensification caused by AI, the bill introduces, also from a preventive perspective, an amendment to the *Employment Rights Act* 1996, inserting a section

[897] Similarly, limits are provided, in that the review may not take place if it is not reasonably practicable, or if the request duplicates another handled in the last three months, or is deemed vexatious or excessive. Assessment of the latter must consider several factors, such as the frequency and similarity to previous requests, the time elapsed since the last one, and any overlap with other submitted requests. In any case, it is the employer's responsibility to demonstrate that the request is abusive or excessive. Ultimately, the Secretary of State has the power to issue regulations defining in detail what "*reasonably practicable*" means, the necessary training for the competent officer, the appointment procedure, and the manner in which reconsideration should be conducted. Such regulations may be differentiated depending on circumstances to adapt to various work situations.

titled "*Part 6B*", which establishes a legal right to disconnect, inspired by similar experiences already adopted in Europe and Australia.

Initially, the concept of "*agreed working hours*" is introduced, defined as the period during which the employee is entitled to remuneration, excluding holidays or other paid leave. Unless the employer provides evidence to the contrary, these hours correspond to those recorded in documents provided under the Employment Rights Act 1996.

In general, employers cannot require employees to work or respond to work-related communications outside their ordinary working hours.

Two exceptions are provided: the existence of a valid collective agreement under Section 178 of the *TULRCA* 1992 or a "*working agreement*" compliant with the Working Time Regulations 1998; or the employer demonstrating a genuine economic or operational emergency that could jeopardize the proper functioning of business activities.

Furthermore, employers are required to issue a written statement to each employee, confirming their right to disconnect outside of working hours, except in emergencies. Before preparing this statement, the employer must consult a recognized trade union, taking into account relevant guidance issued by *ACAS* (*Advisory, Conciliation and Arbitration Service*). The first statement must be issued in accordance with procedures established by regulation from the Secretary of State and must be renewed every 12 months. In addition, *ACAS* must prepare and publish a code of conduct for employers, employees, and unions, containing practical guidance on the application of these provisions. Before adopting the code or any amendments, *ACAS* must consult the Secretary of State, trade unions, employers' organizations, and other parties adequately representing the interests of workers and businesses[898].

Ultimately, to rebalance data-related power, the bill grants trade unions the right to access data used in decision-making processes affecting their members, while *ACAS* is tasked with providing practical guidance on the use of AI and workplace data management.

Specifically, before making high-risk decisions, particularly those involving the use of AI systems in decision-making processes, the employer must initiate prior consultation with the potentially affected workers' representatives.

This consultation must occur in a timely manner, at least one month before the decision, and, if the high-risk decision-making process is ongoing, it must be renewed annually.

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[898] TUC, "*The AI Bill project - the background, process and key provisions of the AI (Employment and Regulation) Bill*", in Tuc: Trade Union Congress, 2024, pp. 1-8.

Where workers are affiliated with a category represented by a recognized union, the representatives to consult are those of the union. In all other cases, the consultation is conducted with representatives appointed or elected by the employees who have the authority to receive information and be consulted on high-risk decisions, or with representatives specifically elected for this purpose according to the procedures provided by applicable law.

The consultation primarily concerns risks to workers' rights protected by legislation such as the *Equality Act* 2010, *Human Rights Act* 1998, *Health and Safety at Work etc. Act* 1974, *Data Protection Act* 2018, and the *UK GDPR*, as well as the measures the employer intends to adopt to reduce or eliminate such risks.

Additionally, the consultation examines the legitimate concerns and interests of workers, including the need to minimize the use of high-risk or potentially harmful AI systems, assess the impact on workers' well-being, and consider the risk of a reduction or other negative effects on the human dimension of the employer-employee relationship[899][900].

5. *Algorithmic management and occupational health and safety in digital platforms: a comparative perspective across Italy, Spain, and the United Kingdom.*

Having set out the preliminary considerations on prevention in each of the three legal systems, it should be noted that, within the Italian context, both the *Charter of Fundamental Rights of Digital Labour in the Urban Environment*[901] and the newly introduced Chapter V-

[899] Moreover, to ensure transparency, the employer must provide the representatives with a written information pack describing the proposed AI system and its value chain, the date from which it is intended to be used in high-risk decision-making processes, the categories of decisions involved, the objectives and logic of the system, the data to be processed and the role of employees' personal data in decisions, how the system's accuracy will be monitored, the metrics used, monitoring of risks to workers' rights, an overall risk assessment, the measures planned to eliminate or reduce risks, and a copy of the register created under Section 16 of the Act. This information must be delivered to representatives either by hand or postal mail to the address they provided to the employer, or, in the case of trade union representatives, to the head office or main branch of the union. The employer must also allow representatives access to affected employees and provide adequate premises and facilities to carry out their functions. If particular circumstances make full compliance difficult, the employer must take all reasonably practicable measures to comply. If employees have not, after prompting, elected their representatives within a reasonable time, the employer is obliged to provide the information directly to each worker. Lastly, the provision clarifies that the consultation does not confer additional rights to unions, representatives, or employees beyond those already provided by law.

[900] For a complete examination of this bill, see TUC, "*Artificial Intelligence (Employment and Regulation) Bill*", in Tuc: Trade Union Congress, 2024.

[901] In the autumn of 2017, a group of food delivery riders in Bologna suspended work and gathered at the City Hall to demand improved working conditions, drawing attention to the pressing need to ensure adequate health and safety protections in the performance of their activities. The Municipality of Bologna responded swiftly, inviting digital platforms to engage in dialogue on possible measures to enhance the working conditions of platform workers within the city. Shortly thereafter, negotiations commenced among the municipal authorities, local trade unions (CGIL, CISL and UIL), the Riders Union Bologna, and several digital platforms. These discussions culminated, in 2018, in the adoption of the *Charter of Fundamental Rights of Digital Labour in the*

bis of Legislative Decree No. 81/2015 (to be examined later) have sought to contain the risks discussed in the preceding paragraphs by introducing limitations on algorithmic management within the platform economy.

These measures were adopted in response to certain structural features of digital platforms that have produced adverse effects on the physical and psychosocial health and safety of platform workers[902].

The *Charter of Rights*, originally a voluntary agreement signed by several platforms in 2018, was designed to guarantee a comprehensive framework of protections for platform workers, including occupational health and safety management systems encompassing risk assessment, the provision of protective equipment, and insurance against accidents and occupational diseases. Articles 2 and 3 of the Charter enshrine rights of information and transparency concerning digital monitoring and reputational evaluation mechanisms.

Specifically, under article 2, workers are entitled to receive prior and comprehensive information on the terms and conditions of their contractual relationship, including, pursuant to paragraph 2, the nature and scope of the platform's digital monitoring practices[903].

Urban Context of Bologna. To date, four delivery platforms operating in the city, *MyMenu*, *Sgnam* (later merged into *MyMenu/Sgnam*), *Domino*'s Pizza, and *Winelivery*, have voluntarily signed the Charter, collectively employing the majority of food delivery riders active in Bologna. The role of the Riders Union Bologna proved pivotal in this local initiative: the movement's efforts centred on mobilising citizens and municipal institutions, particularly the City Council, to advocate for fair and safe working conditions. This grassroots organisation demonstrated that an informal form of trade unionism could successfully mobilise and exert pressure to counteract the poor working conditions to which these workers were exposed, including those relating to occupational health and safety within platform-mediated activities. (M. MOHLMANN, L. ZALMANSON, "*Hands on the wheel: navigating algorithmic management and Uber drivers' autonomy*", Research Paper for the International Conference on Information System, 2017). The Charter applies to all platform workers operating within the city of Bologna, irrespective of their contractual status. This approach circumvents the well-known legal and practical challenges linked to the classification of platform workers, an area in which local authorities lack specific competence. From a pragmatic standpoint, the general reluctance of digital platforms to accept employment classifications other than self-employment would otherwise have made the conclusion of any agreement virtually impossible. Furthermore, the Charter stipulates that its provisions shall apply whenever the digital platform determines both the organisation of work and the pricing of the service. Consequently, the Charter's scope of application is broad, encompassing all categories of platform workers. In practice, however, the principal focus has been on *delivery riders*, unsurprising given that, across Europe (including Italy), public and policy debates have largely centred on this particular category. Their greater visibility, as compared to more "invisible" forms of platform work (such as online freelancing or home-based services), and their tangible impact on traditional economic sectors, have made them a more accessible and symbolic locus of discussion. Trade union organisations consulted in connection with this case study have emphasised that substantial efforts are still required to engage platform workers operating in sectors other than delivery (for instance, domestic work or online services). Nonetheless, it is worth noting that the Municipality of Bologna is actively encouraging the participation of these other groups of platform workers in the ongoing process (EU-OSHA, "*Italy: a national and local ansie to the challanges of the platform economy*", 2022, p. 3).

[902] P. BERASTEGUI, *"Exposure to psychosocial risk factors in the gig economy: A systematic review"*, *cit*., 2021.

[903] Article 2, entitled *"Duty to Inform"*, provides that: "1. *Digital platforms shall be required to provide all their workers and collaborators with prior and comprehensive information concerning the contractual arrangement. 2. The information referred to in paragraph 1 shall include: (a) the identity of the parties to the employment relationship; (b) the place of work, including reference to the territory in which the activities are performed; in*

Furthermore, article 3 of the Charter requires digital platforms to inform workers of the existence and implications of reputational assessment mechanisms, while establishing an impartial procedure through which workers may challenge such evaluations[904].

Subsequently, the Italian legislature adopted Legislative Decree No. 104 of 27 June 2022, the so-called *Transparency Decree*, implementing Directive (EU) 2019/1152 on transparent and predictable working conditions. This complex legislative measure amended Legislative Decree No. 152 of 1997, with the aim of strengthening workers' rights to be informed about the essential elements of the employment relationship and the conditions under which work is performed, extending protections to employees in both the private sector and public administration.

Before analysing the provisions of this new framework, however, a few preliminary observations are in order.

It is worth recalling that Directive (EU) 2019/1152, as previously discussed, does not specifically address platform work. Rather, it extends its regime on transparent and predictable working conditions to platform workers only insofar as their contractual relationships can be classified as subordinate employment.

Accordingly, it is advisable to read that Directive in conjunction with the one specifically aimed at improving working conditions for individuals performing platform work.

The latter introduces distinct information obligations where automated decision-making or monitoring systems are employed[905]; this justifies addressing, first, the notion of "*automated decision-making and monitoring systems*" before turning to Legislative Decree No. 104 of 27

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the absence of a fixed or predominant place of work, the principle that the worker is employed in various locations or is free to determine his or her own workplace, as well as the registered office or, where applicable, the domicile of the employer; (c) the nature or category of the employment assigned to the worker, or a concise description of the work; (d) the date of commencement of the employment relationship; (e) where the employment is temporary, the end date or expected duration thereof; (f) the agreed remuneration or compensation, together with the frequency and method of payment to which the worker is entitled; (g) the duration and conditions of any probationary period, if applicable; (h) any training rights granted by the employer and/or the digital platform; (i) the procedure, including the length of the notice period, to be followed by both the employer (and/or the digital platform) and the worker in the event of termination of the employment relationship; (j) the minimum number of guaranteed paid hours, proportionate to the worker's availability as agreed between the parties; (k) the definition of the reciprocal right of withdrawal, in accordance with Article 5; (l) the work equipment, if any, provided to the worker and related information, including with respect to possible remote monitoring of performance; (m) the insurance coverage referred to in Article 6, concerning accidents and damage affecting digital workers or third parties in the course of the performance of their duties, together with the applicable compensation limits and the procedures for disbursement of indemnities".

[904] Article 3, entitled *"Reputational Mechanisms"*, provides that: "*1. Digital platforms shall be required to: (a) inform their workers, collaborators, and users/consumers about the methods used to generate and process reputational ratings, where such ratings exist, and the potential effects that such ratings may have on the employment or collaboration relationship; (b) guarantee workers or collaborators a third-party, impartial procedure through which they may contest a rating deemed inaccurate; (c) ensure access to documentation suitable to attest to the worker's experience when transferring from one platform to another*".

[905] Chapter III of the Directive.

June 2022, as the analysis developed in this regard can be readily transposed to that legislative context.

To begin with, the *Platform Work Directive*, mindful of the diversity of platforms operating in the labour market, carefully delineates its scope of application.

It applies solely to digital labour platforms providing commercial services, provided that three conditions are met: the service is offered, at least in part, through electronic means such as a website or app; it is supplied at the request of a specific recipient; and the organisation of remunerated work, whether performed *online* or *offline*, is not merely ancillary but is managed, to some extent, by the platform itself.

Consequently, the Directive appears to exclude from its scope those digital platforms that merely act as intermediaries between supply and demand without exercising control over how work is organised or performed.

Another point of debate in the drafting of the Directive concerned its terminological shift, particularly the introduction of the expression "*automated decision-making and monitoring systems*", an expression also adopted, as will be seen, by Legislative Decree No. 104/2022.

While the notion of "*monitoring systems*" was immediately associated with mechanisms for supervising workers' performance[906], ambiguity surrounded the precise meaning of "*automated decision-making systems*".

In the absence of a clear statutory definition, this gap has been tentatively filled[907] through reference to the *Guidelines on Automated Decision-Making* issued under Regulation (EU) 2016/679 (the *GDPR*)[908], which essentially describe automated decision-making as the use of technology to manage or organise work performance without any human intervention.

Yet, this reference has not dispelled interpretative uncertainty regarding the degree of human involvement necessary to determine when such information duties arise[909].

A preliminary response to this issue was offered by Circular No. 19/2022 of the Ministry of Labour and Social Policies, which sought to clarify the scope of Legislative Decree No.

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[906] A. DONINI, "*Informazione sui sistemi decisionali e di monitoraggio automatizzati: poteri datoriali e assetti organizzativi*", in DLM, 2023, n. 1, pp. 85 ss.

[907] E. C. SCHIAVONE, "*Gli obblighi informativi in caso di sistemi decisionali o di monitoraggio automatizzati (art. 4, co. 1, lett. a, d.lgs. n. 104/2022) (art. 1, co. 1, lett. s, e art. 1-bis, d.lgs. n. 152/1997, inserito dall'art. 4, co. 1, lett. b, d.lgs. n. 104/2022)*", in D. GAROFALO, M. TIRABOSCHI, V. FILÌ, A. TROJSI (a cura di), Trasparenza e attività di cura nei contratti di lavoro. Commentario ai decreti legislativi n. 104 e 105 del 2022, ADAPT, pp. 211 ss.

[908] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, repealing Directive 95/46/EC (*General Data Protection Regulation*).

[909] See Court of Padova, labour section, 3 march 2023, n. 126 in DRI, 2023, 4, p. 1072; Court of Palermo, labour section, 3 april 2023, n. 14491, in RIDL, 2023, 2, II, p. 367 and Court of Torino, 5 august 2023, n. 3065, in Bollettino ADAPT.

104/2022 by distinguishing between monitoring systems, for which information must always be provided, and decision-making systems, about which workers must be informed only when such systems operate in a fully automated manner[910].

Following this ministerial interpretation, the Italian legislature recently amended article 1-*bis* of Legislative Decree No. 104/2022 to further specify the degree of human intervention. The revised provision makes clear that the regulatory framework applies exclusively to decision-making and monitoring systems that are entirely automated[911].

Indeed, article 1-*bis*, paragraph 1, provides a legal definition of "*fully automated decision-making or monitoring systems*", which are tools that influence decisions concerning recruitment, management, or termination of the employment relationship, the assignment of tasks and duties, as well as the supervision, evaluation, and performance of work-related obligations. From the perspective of occupational health and safety, the assignment of duties and the monitoring of work performance are directly connected to the employer's obligations in this area, since, under article 18 (para.1)(c) of Legislative Decree No. 81/2008, employers and managers are required to take into account workers' capacities and health conditions when allocating tasks and to ensure, pursuant to paragraph 3-*bis* of the same article, compliance with preventive obligations by workers and supervisors.

Although extending the scope of application to all decision-making systems might appear to excessively broaden the informational duties established at both the European and national levels, it is difficult to exclude from the legislation those predominantly automated decision-making and monitoring systems in which human intervention still plays a major role in managing and assessing performance[912].

Even in such cases, it remains essential to safeguard workers, as the more vulnerable party to the employment contract, against informational asymmetries, which are particularly pronounced in platform-based work.

In this regard, it is worth noting that the only criterion set by the legislature concerns the provision, by such systems, of "relevant" indications, often managed by the same digital platforms which therefore act as employers or principals, on specific aspects of the employment relationship, including recruitment, assignment of duties, the exercise of

[910] See p. 3 of Circular No. 19/2022.

[911] It should be noted that article 1-*bis* of Legislative Decree No. 104/2022 has recently been amended by article 26(2) of Decree-Law No. 48 of 4 May 2023, which, following the interpretation provided by the Ministry of Labour and Social Policies in Circular No. 19/2020, introduced the adverb *"integrally"* with reference to automated decision-making and monitoring systems.

[912] A. MARESCA, relazione al *Webinar* "*Decreto Trasparenza – D.lgs. n. 104/2022: nuovi obblighi informativi per i datori di lavoro*", in MMBA, 16 september 2022.

managerial prerogatives, management and termination of the relationship, as well as supervision and evaluation of the proper performance of work activities.

Similarly, in Spain, both the *Tripartite Agreement*[913] of 10 March 2021[914] (concluded between the Government, through the Ministry of Labour and Social Economy, the national social partners, the most representative trade unions, and employers' organisations) and the subsequent legislation introduced a significant reference to the automation of work management and the evaluation of performance through algorithmic control by the employer.

In this regard, it should first be noted that article 25 of Law 31/1995 establishes, in a manner similar to article 18 of Legislative Decree No. 81/2008, that the employer must protect workers who possess personal characteristics or biological conditions, including disabilities, that render them particularly vulnerable to occupational risks, and must therefore take such characteristics into careful consideration during risk assessment and the adoption of appropriate preventive measures.

Moreover, the employer is prohibited from assigning tasks that may expose workers to any danger if, due to their personal characteristics or temporary conditions, they do not meet the physical and psychological requirements necessary to perform such activities safely[915].

Secondly, the opacity of such methods of monitoring work performance is striking, as they are often presented in an authoritarian manner as immutable and objective tools for measuring workers' productivity.

Law No. 12/2021, known as the *Rider Law*, addresses this issue within the traditional framework of workplace collective representation, which, in the Spanish system, is based on a dual model: on the one hand, unitary elective representation (such as the works council or staff delegates), and on the other, trade union representation through workplace union sections.

The explanatory memorandum of the law justifies the inclusion of this topic as the result of a "shared reflection" within the framework of social dialogue, highlighting the need to consider the impact of new technologies on work and to adapt labour legislation accordingly, taking into account both individual and collective workers' rights, as well as fair competition among undertakings.

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[913] F.DIEZ, "*Las plataformas de reparto y la ley "rider" en España. Historia, seguimiento y análisis*", in Observatorio de trabajo, algoritmos y sociedad, Madrid, 2023.

[914] F.M. FERRANDO GARCIA, "*Algunas reflexiones sobre la regulación del trabajo a través de las plataformas digitales*", *cit*.

[915] Art. 25, *Ley 31/1995, de 8 de noviembre, de prevención de Riesgos Laborales*, in Boletin Oficial de Estado, updated to 2022.

Likewise, in the United Kingdom, it must be observed that the use of algorithmic management tools has also produced a series of adverse effects on workers. In this respect, the national legal system does not, at first glance, appear to encourage the involvement of workers in the systems and processes adopted by employers, since the law instead grants employers a considerable degree of discretion to manage the workplace as they see fit and to require employees to obey reasonable and lawful instructions issued by employers or managers.

This authority extends to the organisation and management of production processes, including decisions and directives concerning the adoption or implementation of new systems and technologies in the workplace[916].

Conversely, such prerogatives, while seemingly broad, are not unlimited in the context of algorithmic management, as there are specific rules designed to regulate the adoption and use of algorithmic tools in the workplace by employers.

Moreover, duties imposed under *common law* upon employers throughout the employment relationship may also constrain their authority in the use of algorithmic management systems[917]. It is, however, worth observing that, notwithstanding the fact that the aforementioned duties are to be informed by the principles of care, mutual trust, and good faith, even insofar as they encompass the issuing of instructions regarding the introduction of new technological systems within the workplace, there exist, in reality, no general provisions under English law specifically designed to mitigate such circumstances. Unlike in other jurisdictions, such as Italy or France[918], employers are neither required to obtain the prior consent of workers before deploying surveillance or algorithmic management technologies, nor to seek authorisation through collective bargaining mechanisms.

For the purposes of the present analysis, which concentrates on the occupational health and safety risks associated with algorithmic management within the employment relationship, it is essential to acknowledge that employers are nevertheless bound by a number of significant obligations when introducing such systems.

In particular, as will be discussed in greater depth below, these include the duty to ensure, so far as is reasonably practicable[919], that employees and other affected persons are not exposed to risks to their health and safety; the obligation to undertake risk assessments in respect of

[916] See *Cresswell v Board of Inland Revenue*, 1984, in ICR 508.
[917] See *Malik v Bank of Credit and Commerce International S.A.*, 1998, *AC* 20.
[918] I. ARAMAROLI, E. DAGNINO, "*A seat at the table: Negotiating data processing in the workplace*", in CLLPJ, 2019, 41(1), pp. 173–196; V. DE STEFANO, "*"Master and servers": Collective labour rights and private government in the contempo rary world of work*", in CLLPJ, 2020, 36(4), pp. 425–444.
[919] *Health and Safety at Work etc. Act* 1974, regs 2 and 3.

any substantial modification of working practices[920]; and the duty to consult workers on any measure likely to exert a material impact on health and safety, including those arising from the deployment of new workplace technologies[921].

These duties, albeit codified, remain of limited normative reach.

Far from addressing the broader spectrum of adverse consequences that algorithmic management may produce on working conditions and labour rights, they are confined to the health-related dimensions of such systems, and, more specifically, to their initial phase of implementation, with no requirement for continuous supervision or periodic evaluation thereafter. Furthermore, the current framework provides workers with scant procedural voice in relation to algorithmic management, thereby curtailing their capacity to challenge employers' assertions that such systems pose no detrimental effects on health and safety.

In practice, employers frequently approach these assessments and consultations as perfunctory exercises of bureaucratic compliance, a tendency exacerbated by the absence of a robustly funded inspection regime capable of identifying and sanctioning breaches of health and safety obligations[922], as well as by the lack of civil liability for infringements of health and safety legislation[923].

To offset these deficiencies, however, certain channels remain available through which workers may exercise a measure of influence and articulate their concerns within this domain.

5.1. Informational and consultation obligations regarding automated systems: impacts on worker health, safety, and participation.

Having laid out the above premises, it needs to focus our attention on some specific aspects arising from the comparative analysis between the three countries under examination, particulary in relation to information and consultation obligations. In this regard, starting from Italian context, article 4 of Legislative Decree No. 152/1997, as amended by Legislative Decree No. 104/2022, the employer is required to provide the employee with clear and transparent information, either in paper or digital format, ensuring its preservation and accessibility, as well as keeping proof of transmission or receipt of such information.

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[920] *The Management of Health and Safety at Work Regulations*, 1999, reg 3.

[921] Art. 3, lett. e), *Safety Representatives and Safety Committees Regulations 1977; Health and Safety* (Consultation with Employees) Regulations 1996).

[922] P. JAMES, D. WALTERS, "*Health & Safety at Work: Time for Change*", in Institute of Employment Rights, 2016.

[923] Section 69 of the Enterprise and Regulatory Reform Act 2013 provides that statutory duties relating to health and safety may, nevertheless, influence the content of the duty of care owed by employers to employees under common law, as affirmed in *Jagger v Holland*, 2020, EWHC 46 (QB).

Of particular relevance is paragraph 8 of article 4, which introduces into Legislative Decree No. 152/1997 a new article 1-*bis*, entitled "Additional information obligations in the case of the use of automated decision-making or monitoring systems," establishing that both public and private employers have the duty to inform workers whenever they make use of automated systems for the management of significant aspects of the employment relationship.

Essentially, the information obligation concerns both "*the categories of data and the main parameters used for programming*" and those used to "train" the automated system.

Specifically regarding the role played by automated systems in the direction and control of employment relationships, it should be noted that, according to the literal wording of article 1-*bis*, first paragraph, it is not required that the "*automated system*" make decisions entirely independently of any human intervention; it is sufficient that the IT procedure provides "relevant information" for the exercise of contractual freedom or managerial powers in the employment relationship, or "indicative guidance" concerning supervisory and control powers.

These provisions are additional to those already set out in Article 4 of Law No. 300 of 20 May 1970 (also known as the *Workers' Statute*).

In this regard, it is reasonable to focus on the connection between automated monitoring systems and the rules concerning limitations on the installation of remote control instruments, with reference to the information obligations established by Circular No. 19/2022 of the Ministry of Labour.

In particular, two types of systems require specific information: those that organize and coordinate work performance, and those that affect the monitoring, evaluation, and compliance of performance[924], for which it is essential to verify whether, in relation to the installation of such systems, compliance with the provisions of article 4 of the Workers' Statute is required.

Regarding the latter issue, three elements can be considered linking the regulations on monitoring systems and remote control.

First, there are cases in which the installation of such systems may require a procedure of approval through a union agreement or, in its absence, authorization from the *National Labour Inspectorate* (INL), as provided by article 4 of the Workers' Statute, where monitoring systems imply indirect control of work activities; however, this occurs very rarely, because often the monitoring system coincides with the instrument used by the worker to

[924] Circ. 19/2022 of the Ministry of Labour and Social Policies, in INL-circolare-4-2022-chiarimenti-decreto-trasparenza.pdf

perform the work[925], thereby exempting, here comes the second element, the employer from such procedure by express legal provision[926].

In these cases, the information rules aimed at improving working conditions and those on remote control operate in parallel, with distinct purposes but partially overlapping recipients.

However, the main critical point lies in the use of data collected for work purposes, for which a close coordination between the information requirements under article 1-*bis* of Legislative Decree 152/1997 and those of article 4 of the Workers' Statute is necessary.

This form of coordination has also been clarified by the *Italian Data Protection Authority*[927], which considers that monitoring systems involve the processing of workers' personal data, thereby requiring compliance with data protection legislation.

Accordingly, the information provided pursuant to article 1-*bis* of Legislative Decree No. 152/1997 regarding the use of automated monitoring systems constitutes, in essence, an additional obligation beyond the information required concerning the use of remote control instruments under article 4 of Law No. 300/1970.

With these clarifications, it should be noted that paragraph 2 of the new article 1-*bis* (introduced by Article 4, paragraph 1, letter b) of Legislative Decree No. 104/2022)[928] establishes that the employer or principal must provide the worker with further details before the commencement of work, including information regarding the areas of the employment relationship affected by automated systems, the purposes for which such systems are employed, their functioning and the logic governing their use, the categories of data and main parameters used for programming or operating the system (including performance evaluation methods), the measures adopted to monitor automated decisions, any correction processes, and the name of the person responsible for managing system quality, as well as the level of

[925] In this context, it is manifestly evident that, in the delivery of goods on behalf of third parties, the very tool through which the work performance is executed, such as slot booking or route identification, is simultaneously the instrument through which indirect control over the worker's performance is exerted, materialized via the *smartphone*.

[926] Art. 4, paragraph 2, Law No. 300/1970.

[927] Opinion of the *Italian Data Protection Authority*, "*Interpretative and applicative issues regarding the enforcement of Legislative Decree No. 104 of 27 June 2022 concerning transparent and predictable working conditions (so-called 'Transparency Decree')*," dated 13 December 2022.

[928] It should be clarified that paragraphs 3 to 6 of Art. 1-*bis* of Legislative Decree No. 152/1997 provide the worker with a right of access to data and to request additional information. The employer or the contracting entity is obliged to provide a written response within thirty days, including guidance for the worker on data security and the updating of processing records. Additionally, any changes affecting the previously provided information, which entail modifications of the working conditions, must be communicated in writing to the worker with at least 24 hours' notice. All information and data must be conveyed transparently, in a structured, commonly used format, and readable by automatic devices. See, in this regard, M. CORTI, A. SARTORI, "*Il recepimento del diritto europeo in materia di condizioni di lavoro trasparenti e prevedibili e di conciliazione vita-lavoro. Le misure giuslavoristiche dei decreti "aiuti"*", in RIDL, 2022, IV, p. 166.

accuracy, robustness, and cybersecurity of the systems, together with any metrics that may have discriminatory effects.

The amendment to article 1-*bis* of Legislative Decree No. 152/1997, enacted through Decree-Law No. 48/2023 (converted into Law No. 85 of 3 July 2023), has narrowed the scope of the information obligation to cases involving fully automated decision-making or monitoring systems.

However, the "protection gap" resulting from such a limitation appears to be mitigated by article 13, paragraph 2, letter f) of the *GDPR*, which imposes specific information obligations on the employer when personal data are processed using automated decision-making processes, even partially, such as in the case of profiling[929], requiring significant information regarding the logic used and the consequences relevant to the data subject.

Applying such an obligation to occupational health and safety, it should be recalled that article 36, paragraphs 2(a) and (c), of Legislative Decree No. 81/2008 already establishes a substantial information duty for employers, who must provide each worker with adequate information concerning the specific risks related to their activities, as well as the protection and prevention measures implemented by the company.

Furthermore, it should be noted that preliminary information must also include potential risks that could affect workers' physical and mental health, given their connection with the use of artificial intelligence systems.

However, unlike the obligation under article 1-*bis*[930], this information does not need to be provided in written form, since article 36, paragraph 4, of Legislative Decree No. 81/2008 requires only that the content be intelligible, without specifying a particular format[931].

In Spain, a similar obligation is established under article 18 of Law 31/1995 on the prevention of occupational risks, which, as previously noted, requires the employer to adopt appropriate measures to ensure that workers receive all crucial information regarding health and safety risks, both those affecting the company as a whole and those specific to each type of task or

[929] See Art. 22, paragraphs 1 and 4, *GDPR*.

[930] It is noteworthy that paragraph 2 of art. 1-*bis* does not explicitly require that such information be provided in written form. Conversely, written form appears to be expressly contemplated for the informational updates referred to in paragraphs 3 and 5 of the same provision. Regardless, paragraph 6 stipulates that information must be provided "*in a structured, commonly used format, readable by automatic devices*", which implies the necessity of a written format, including digital form.

[931] Case law has clarified that information regarding health and safety may be provided through various forms and instruments, provided they comply with the so-called *adequacy criterion* (*criterio di adeguatezza*).. See *Supreme Court*, criminal section IV, 19 january 2011, n. 9923, in Guida al diritto, 2011, n. 21, p. 58; *Supreme Court*, criminal section IV, 8 june 2010, n. 34771, in Cassazione penale 2011, n. 10, p. 3556.

role, the preventive and protective measures applicable to such risks, as well as the so-called *emergency measures* adopted in accordance with article 20 of the same law.

It can be noted that, in companies where worker representatives are present, the employer is required to provide this information through such representatives; however, each worker must still receive direct information regarding the specific risks associated with their role and the applicable protection and prevention measures.

Additionally, the employer is obligated to consult workers and enable their participation in all matters concerning health and safety, in accordance with the provisions of Chapter V of the aforementioned law[932]. In particular, article 33 establishes that the employer has a timely duty to consult workers when making decisions regarding, for the purposes considered here, the planning and organization of work within the company and, especially, the introduction of new technologies, insofar as these, including the choice of equipment, the suitability of work execution methods, and the impact of environmental factors in the workplace, may have significant effects on the health and safety of the workers[933].

In the context of the United Kingdom, the relevant regulations are the *Information and Consultation of Employees Regulations 2004* (ICER), which implement Directive 2002/14, thereby establishing one of the legal frameworks ensuring mandatory worker consultation regarding corporate decisions, even if such regulations apply only to companies with at least 50 employees.

Specifically, where more than 2% of the workforce (with at least 15 employees) requests it, the employer, under Regulation 7 of the ICER, is required to initiate negotiations with employees or their representatives to define the scope of information and consultation rights, which may also include algorithmic management.

If a customized agreement is not reached, the standard ICER rules apply, providing consultation on employment developments and, under Regulation 20, regarding decisions that involve significant changes in the organization of work or contracts; in essence, these provisions allow workers to require the employer to initiate consultations concerning the use of algorithmic systems that may significantly affect work management.

Regarding health and safety specifically, under Section 3(e) of the *Health and Safety (Consultation with Employees) Regulations* 1996, in the absence of a recognized union, the

[932] Art. 18, *Ley 31/1995, de 8 de noviembre, de prevención de Riesgos Laborales*, in Boletin Oficial de Estado, 2022.

[933] Art. 33, *Ley 31/1995, de 8 de noviembre, de prevención de Riesgos Laborales*, in Boletin Oficial de Estado, 2022.

employer is required to consult directly with employees or a non-union representative elected by the workers themselves[934].

In such cases, pursuant to Section 5 of the *Health and Safety Regulations*, the employer must provide all information in their possession to enable full and effective worker participation in the consultation process[935].

A similar duty of consultation could certainly have been strengthened had the provisions contained in the Bill entered into force as set out in Section 15 of Part III of the *Artificial Intelligence* (*Regulation and Employment Rights*) *Bill* 2024[936] (although, it is noted, it has not yet come into force) according to which corporate decisions involving the use of high-risk artificial intelligence systems could undergo careful assessment, particularly when such technologies can affect employee well-being.

In this regard, the law would require that the employer, at least one month prior to adopting such decisions, duly considers the concerns and legitimate interests of potentially affected employees.

Specifically, among the issues that employers would be required to examine are the need to minimize risks associated with the use of AI, the potential impact on employee well-being, and possible negative consequences for the human connection between the worker and the company.

Accordingly, as previously explained, employers, in order to comply with these rules, would require to conduct a WAIRA, sharing its results with employees, as well as to listen to concerns raised by workers and discuss possible modifications aimed at mitigating any identified adverse effects.

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[934]Section 3(e) of the *Health and Safety (Consultation with Employees) Regulations*, in Legislation.gov.uk., 1996, entitled "*Duty of employer to consult*", states: "*Where there are employees who are not represented by safety representatives under the 1977 Regulations, the employer shall consult those employees in good time on matters relating to their health and safety at work and, in particular, with regard to, (a)the introduction of any measure at the workplace which may substantially affect the health and safety of those employees; (b)his arrangements for appointing or, as the case may be, nominating persons in accordance with; (c)any health and safety information he is required to provide to those employees by or under the relevant statutory provisions; (d)the planning and organisation of any health and safety training he is required to provide to those employees by or under the relevant statutory provisions; and (e)the health and safety consequences for those employees of the introduction (including the planning thereof) of new technologies into the workplace*".

[935] Section 5(1)of the *Health and Safety (Consultation with Employees) Regulations*, in Legislation.gov.uk, 1996, entitled "*Duty of employer to provide information*", establishes that "*Where an employer consults employees directly he shall, subject to paragraph (3), make available to those employees such information, within the employer's knowledge, as is necessary to enable them to participate fully and effectively in the consultation*".

[936] The text was intended to regulate the use of artificial intelligence in the workplace (e.g. automated decision-making and the right to disconnect), but it remained a proposal put forward by the social partners and did not proceed through the parliamentary process.

This procedure is intended to ensure that corporate decisions regarding the use of AI are made consciously and are oriented toward protecting the psycho-physical well-being of the employees themselves[937].

Moreover, considering the growing body of evidence highlighting health risks associated with algorithmic management, it is entirely reasonable that employers should always consult with employees regarding health and safety implications arising from the introduction of such technologies.

However, it cannot be overlooked that the consultation and information mechanisms currently in place are often ineffective in ensuring meaningful employee participation in employer decisions regarding technological implementation.

While such mechanisms could be useful for raising awareness about algorithmic practices within the company, they do not provide workers with effective influence over management, leaving employers free to make unilateral decisions regarding the technologies introduced in the workplace[938].

5.2. The role of trade unions in consultation and transparency in the use of algorithmic systems across the three countries.

From the perspective of worker representation, it is also noteworthy that, in the Italian legal system, paragraphs 3 and 6 of Article 1-bis of Legislative Decree no. 152/1997, as amended by Legislative Decree no. 104/2022, far from assigning a role solely to the workers

[937]Section 15 of the *Artificial Intelligence (Regulation and Employment Rights) Bill*, entitled "*Direct consultation with employees and workers*", states that: "*(1) High-risk decision-making shall not take place unless, at least one month before the high-risk decision-making takes place, the employer has taken into account the concerns and interests of workers or employees who are or may be affected by it. (2) In this Act, the concerns and interests of workers and employees, include all legitimate concerns and interests, including – a. Understanding and minimizing the deployment of detrimental high-risk artificial intelligence systems, b. The impact or potential impact of artificial intelligence systems upon workers and employees in relation to their well-being, and c. The potential for any diminution or other adverse effect on the degree of human connection with their employer. (3) In order to take into account, the concerns and interests of employees or workers pursuant to subsection (1) employers shall – a. Complete a WAIRA in accordance with section 14, b. Share that WAIRA with their employees and workers, c. Listen to the concerns and interests of their employees and workers in relation to the WAIRA, and d. Discuss how any adverse aspects identified in the WAIRA can be removed or modified. (4) Once high-risk decision-making starts, the process in subsection (3) must be repeated every 12 months for as long as decision-making continues. (5) The Secretary of State shall by order provide guidance as to the process identified in subsection (3), and how account is to be given to such guidance. (6) Such guidance may provide for different ways for employers to proceed for different classes of employment, and for different levels of risk. (7) Before preparing guidance under subsection (5), the Secretary of State shall consult with such of the following as he considers appropriate - a. trade associations, b. trade unions, and c. persons who appear to the Secretary of State to represent the interests of workers*", in Tuc: Trade Union Congress, 2024.

[938] P. COLLINS, J. ATKINSON, "*Worker voice and algorithmic management in post-Brexit Britain*", in ETUI, 2023, pp. 43-44.

themselves, also envisage the participation of their representatives; in this regard, paragraph 6, second sentence, provides that the "*communication of the same information and data must also be made to the company trade union representatives or to the unitary trade union representation and, in its absence, to the territorial offices of the trade unions that are comparatively most representative at the national level*"[939].

It is clear from the wording of this provision that it refers to the general worker representations (*Rsa* or *Rsu*)[940], without, however, explicitly mentioning the role of health and safety representatives (*Rls* or *Rlst*), as indicated in articles 47 and 48 of Legislative Decree no. 81/2008. To address this, a systematic interpretation could allow for extending such information obligations to the specialized health and safety representations, especially where the transmitted information may be relevant to specific occupational health and safety risks[941].

Such joint entitlement to information on automated systems finds a parallel in the Spanish context as well, in the *Ley Rider* (Law no. 12/2021), which, focusing also on the control of artificial intelligence systems and the algorithmic management of working conditions, contains a provision amending article 64.4 of the *Workers' Statute*, adding a new paragraph d), which reads: "*The works council of any company shall have the right, periodically and as necessary, to: be informed by the company about the parameters, rules, and instructions on which the algorithms or artificial intelligence systems influencing decisions that may impact working conditions, employment access, and job retention, including profiling, are based*".

This legislative innovation is appreciated for its originality and timeliness[942], potentially setting a precedent for other EU Member States, as it demonstrates significant responsiveness to a broad productive and organizational transformation, and is, moreover, applicable to all types of platforms, not limited to those active in the delivery sector. The right to information, recognized to elected representative bodies and union delegates in large enterprises, as provided for in article 64.1 of the Workers' Statute, is connected to a duty of algorithmic transparency, which should manifest in collective oversight both before and after the adoption of algorithms (often described as "*black boxes*"[943]) by companies for personnel selection,

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[939] *Tribunal of Turin*, 5 August 2023, in ADL, 2024, 1, p. 125, whereby the lack of specificity regarding the information provided by the company pursuant to Article 1-bis constitutes an anti-union conduct.

[940] L. ANGELINI, "*Rappresentanza e partecipazione nel diritto della salute e sicurezza dei lavoratori in Italia*", in DSL, 2020, n. 1, I, pp. 105 ss.

[941] It should be noted that the same annual information on specific risks related to smart working, provided for under article 22, paragraph 1, of Law No. 81/2017, must be addressed both to the worker and to the workers' safety representative.

[942] R. GOMEZ GORDILLO, *Algoritmos y derecho de información de las personas trabajadoras*, in Temas Laborales, 2021, 157, p. 161-182.

[943] M. ALEMANI ORTIZ, "*Spain is about to shatter the gig economy's algorithmic black box*", in Wired, 2021.

performance evaluation, remuneration, and automated or semi-automated decisions regarding working conditions and the allocation of work; this is explained, as previously examined, in relation to the capacity of algorithmic management to amplify managerial and supervisory power through sophisticated technological tools, facilitating both the monitoring and evaluation of worker performance and the collection of a substantial amount of personal data, with potential negative impacts on employees' mental health and well-being.

In the United Kingdom, it should be noted that, pursuant to Section 4(A)(1) of the *Safety Representatives and Safety Committees Regulations* 1977, there is a general obligation to consult, in favor of worker representatives, regarding all measures that could significantly affect employees' health and safety, accompanied by the provision of additional specific requirements to discuss the implications of new technologies in terms of health and safety[944].

Furthermore, under Section 2(6) of the *Health and Safety at Work etc. Act*, if a recognized trade union exists, the employer is required to appoint a safety representative and consult them for the development and verification of the effectiveness of health and safety protection measures[945].

However, it should be noted that, although these consultation methodologies provide some safeguards regarding algorithmic management, they present significant limitations as instruments for workers in negotiating the use of algorithmic systems, finding, moreover, limited application in the United Kingdom due to the "single-channel" trade union system, within which only trade unions represent employees.

In an attempt to address this issue, Section 39 of the aforementioned *Artificial Intelligence* (*Regulation and Employment Rights*) *Bill* 2024, which inserted Section 198C into the *Trade*

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[944] Section 4(A)(1) del *Safety Representatives and Safety Committees Regulations*, in Legislation.gov.uk, 1977, entitled "*Employer's duty to consult and provide facilities and assistance*", states that "*Without prejudice to the generality of section 2(6) of the Health and Safety at Work etc. Act 1974, every employer shall consult safety representatives in good time with regard to, (a)the introduction of any measure at the workplace which may substantially affect the health and safety of the employees the safety representatives concerned represent; (b)his arrangements for appointing or, as the case may be, nominating persons in accordance with; (c)any health and safety information he is required to provide to the employees the safety representatives concerned represent by or under the relevant statutory provisions; (d)the planning and organisation of any health and safety training he is required to provide to the employees the safety representatives concerned represent by or under the relevant statutory provisions; and (e)the health and safety consequences for the employees the safety representatives concerned represent of the introduction (including the planning thereof) of new technologies into the workplace*". The second paragraph of Section 4(A), establishes that "*Without prejudice to regulations 5 and 6 of these Regulations, every employer shall provide such facilities and assistance as safety representatives may reasonably require for the purpose of carrying out their functions under section 2(4) of the 1974 Act and under these Regulations*".

[945] Section 2(6) of the *Health and Safety at Work etc. Act*, in Legislation.gov.uk, 1974, entitled "*General duties of employers to their employees*", states che "*It shall be the duty of every employer to consult any such representatives with a view to the making and maintenance of arrangements which will enable him and his employees to co-operate effectively in promoting and developing measures to ensure the health and safety at work of the employees, and in checking the effectiveness of such measures*".

Union and Labour Relations (Consolidation Act) 1992, essentially provides that when an employer makes business decisions involving significant risks, it is essential to initiate dialogue with the potentially affected employee representatives, whether they are trade union representatives or other representatives elected by the workers.

This is a consultation process that must begin at least one month before such decisions are taken, to allow sufficient time for meaningful discussion; moreover, once the high-risk decision-making process has started, the employer is required to repeat the consultation at least annually for the entire period of use of the implemented technological system.

It is clear that the purpose of the consultation is to ensure that staff are informed and involved in all significant changes that may potentially affect their rights and working environment.

In particular, in this context, key issues are addressed, including employee rights protected under major regulations on equality, occupational health and safety, and personal data protection.

Furthermore, beyond risk management, the employer must consider aspects such as minimizing potential risks arising from the use of advanced artificial intelligence systems, the effects these systems may have on employees' psycho-physical well-being, and the importance of maintaining an adequate level of human interaction in the workplace.

Specifically regarding the consultation activity, the employer is required to provide precise details about the artificial intelligence system in question, sharing a description of the system itself, explaining how it will be used and which categories of decisions it will influence, indicating the purposes for which the AI is being introduced, explaining the logic by which the system will operate, and providing a clear framework on which data will be used and how it will affect decisions.

Information is also required regarding the system's monitoring methods, to ensure accuracy and identify any potential risks to workers' rights.

Such information must be provided in writing to employee representatives, and the employer must facilitate meetings between representatives and employees to ensure open and transparent discussion; clearly, in the event of difficulties in meeting these deadlines due to particular circumstances, the employer must, in any case, make every effort to maintain alignment with these procedures.

Lastly, it should be noted that if employees are required to elect their representatives for consultation but fail to do so within a reasonable timeframe, the employer is obliged to provide all necessary information directly to each employee; in this way, the involvement of

all affected workers is still ensured, aimed at understanding and evaluating the potential impact of the corporate decisions affecting them[946].

[946] Section 39 dell'*Artificial Intelligence (Regulation and Employment Rights) Bill*, entitled "*Trade Union Consultation*", establishes that: "*The Trade Union and Labour Relations (Consolidation) Act 1992 is amended in accordance with paragraph (2). (2) After section 198B insert – 198C Duty to consult representatives (1) Where an employer is proposing to do high-risk decision-making, it shall consult all the persons who are appropriate representatives of any of the employees who may be affected. (2) The consultation shall begin in good time and in any event at least 1 month before the high-risk decision-making takes place. (3) Once high-risk decision-making starts, the consultation in subsection (2) must be repeated every 12 months for as long as decision-making continues. (4) For the purposes of this section the appropriate representatives of any affected employees are – (a) if the employees are of a description in respect of which an independent trade union is recognized by their employer, representatives of the trade union, or (b) in any other case, whichever of the following employee representatives the employer chooses – (i) employee representatives appointed or elected by the affected employees otherwise than for the purposes of this section, who (having regard to the purposes for and the method by which they were appointed or elected) have authority from those employees to receive information and to be consulted about the high-risk decision-making on their behalf; (ii) employee representatives elected by the affected employees, for the purposes of this section, in an election satisfying the requirements of section 198D(1). (5) The consultation shall include consultation about — (a) the risks to the rights of employees contained in the Equality Act 2010, the Human Rights Act 1998, Health and Safety at Work etc Act 1974, the Equality Act 2010, the Data Protection Act 2018, and the UK General Data Protection Regulation, (b) the measures envisaged to address the risks, (c) In this Act, the concerns and interests of workers and employees, include all legitimate concerns and interests, including – (i) Understanding and minimizing the deployment of detrimental high-risk artificial intelligence systems, (ii) The impact or potential impact of artificial intelligence systems upon workers and employees in relation to their wellbeing, and (iii) The potential for any diminution or other adverse effect on the degree of human connection with their employer. and shall be undertaken by the employer with a view to reaching agreement with the appropriate representatives, (6) For the purposes of the consultation the employer shall disclose in writing to the appropriate representatives— (a) A description of the proposed artificial intelligence system, (b) A description of the relevant value chain, (c) The date from which it is proposed that the system will be used in high-risk decision-making, (d) The categories of high-risk decision which it is proposed the system will take or contribute to, (e) The proposed purpose or aim in using the system, (f) The logic which will underpin the proposed decision-making, (g) The proposed data that will be processed by the system in relation to high-risk decision-making, (h) The way in which the personal data of employees, workers or jobseekers will influence the proposed decisions, (i) A description of how it is proposed to monitor the artificial intelligence system for accuracy, including how that metric will be defined, when high-risk decision-making takes place, (j) A description of how it is proposed to monitor the artificial intelligence system for the risks to worker, employee or jobseeker rights contained in the Equality Act 2010, Health and Safety at Work etc Act 1974, the Human Rights Act 1998, the Equality Act 2010, the Data Protection Act 2018, and the UK General Data Protection Regulation, (k) An assessment of the risks to worker, employee or jobseeker rights contained in the Equality Act 2010, Health and Safety at Work etc Act 1974, the Human Rights Act 1998, the Equality Act 2010, the Data Protection Act 2018, and the UK General Data Protection Regulation, (l) The measures to be taken with a view to eliminating the risks, and (m) A copy of the register created pursuant to s 16 in this Act. (7) That information shall be given to each of the appropriate representatives by being delivered to them or sent by post to an address notified by them to the employer, or (in the case of representatives of a trade union) sent by post to the union at the address of its head or main office. (8) The employer shall allow the appropriate representatives access to the affected employees and shall afford to those representatives such accommodation and other facilities as may be appropriate. (9) If in any case there are special circumstances which render it not reasonably practicable for the employer to comply with a requirement of subsection (2), (3), (4) or (5), the employer shall take all such steps towards compliance with that requirement as are reasonably practicable in those circumstances. (10) Where— (a) the employer has invited any of the affected employees to elect employee representatives, and (b) the invitation was issued long enough before the time when the consultation is required by subsection (2) to begin to allow them to elect representatives by that time, the employer shall be treated as complying with the requirements of this section in relation to those employees if he complies with those requirements as soon as is reasonably practicable after the election of the representatives. (11) If, after the employer has invited affected employees to elect representatives, the affected employees fail to do so within a reasonable time, he shall give to each affected employee the information set out in subsection (5). (12) This section does not confer any rights on a trade union, a representative or an employee except as provided by this Act*", 2024, in ArtificialIntelligence(RegulationandEmploymentRights)Bill16April2024.pdf.

At the conclusion of this process, it is worth emphasizing that article 1-*bis*, to some extent, anticipated the provisions of the European Directive on platform work[947], as well as drawing inspiration from the *Artificial Intelligence Regulation* approved by the European Parliament on 13 March 2024[948], which requires communication of the level of system accuracy, reliability, and *cybersecurity*, as well as the metrics used to measure parameters and the metrics' potentially discriminatory impacts[949].

6. *A focus on the integration between article 47-ter of legislative decree no. 81/2015 and article 1-bis of legislative decree no. 104/2022: informational protections and transparency for digital platform workers.*

Ultimately, it is pertinent to examine the obligations imposed upon digital platform clients to furnish information to workers engaged in the delivery of goods[950], pursuant to article 47-*ter* of Legislative Decree No. 81/2015.

This provision represents a significant step towards ensuring transparency and safeguarding the rights of this category of workers, whose activities are, as repeatedly noted, frequently organized by digital platforms.

The regulations introduced under Chapter V-*bis* of the aforementioned decree are designed to encompass a wide spectrum of employment relationships, including both hetero-organized collaborations and coordinated autonomous work.

In this context, the beneficiaries of the minimum protections envisaged by the legislation must be identified in accordance with the contractual typology and the continuity or occasional nature of the employment relationship.

Nevertheless, a notable interpretative challenge has arisen; on the one hand, article 47-*bis* explicitly refers to autonomous work, even in cases where the remuneration and modalities of task execution are determined by digital platform[951], and on the other hand, it includes the proviso "*without prejudice to the provisions of article 2, paragraph 1*"[952].

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[947] In this regard, Chapter III of the Directive establishes measures aimed at enhancing transparency and the protection of workers' personal data. See, in this regard, R. RAINONE, "*Obblighi informativi e trasparenza nel lavoro mediante piattaforme digitali*", in Federalismi, 2024, n. 3, pp. 280 ss.

[948] A. ALAIMO, "*Il Regolamento sull'Intelligenza Artificiale: dalla proposta della Commissione al testo approvato dal Parlamento. Ha ancora senso il pensiero pessimistico?*", in Federalismi, 2023, n. 25, pp. 133 ss.

[949] M. PERUZZI, "*Intelligenza artificiale, poteri datoriali e tutela del lavoro: ragionando di tecniche di trasparenza e poli regolativi*", in Janus, 2021, n. 24, pp. 71 ss.

[950] See also the objective scope defined under article 47-*bis* of Legislative Decree No. 81/2015.

[951] A. PERULLI, "*Collaborazione organizzata dal committente. Note al d. lgs. n. 81/2015*", in *Rivista Italiana di Diritto del Lavoro*, 2019, n. 4, pp. 163 ss.

[952] Article 47-*bis*, paragraph 1, of Legislative Decree No. 81/2015, as amended by Decree-Law No. 101/2019.

Doctrinal analysis has advanced two principal interpretations.

The first[953] posits that Chapter V-*bis* applies exclusively to hetero-organized collaborations, which, though not constituting subordinate employment, fall within activities structured by a client and are not governed by article 2, paragraph 1, of Legislative Decree No. 81/2015. According to this interpretation, national collective agreements retain the competence to regulate the conditions of such collaborations, including the establishment of minimum economic and normative safeguards. The second[954] advances a broader, more inclusive approach, distinguishing between occasional and continuous workers; under this interpretation, Chapter V-bis would apply to occasional autonomous workers, whereas continuous collaborations organized by the client would remain governed by article 2 of the decree. This reading carries the notable advantage of affording concrete protections even to occasional autonomous workers in the *gig economy*, thereby ensuring them a baseline of rights and safeguards[955].

The focal point of this legislative framework concerns the initial instrument conceived to protect the working conditions of individuals encompassed within Chapter V-*bis*: on one hand, the written form (*ad probationem*[956]) of individual employment contracts[957]; on the other, the information obligations incumbent upon the client pursuant to articles 1 and 1-*bis* of Legislative Decree of 26 May 1997, No. 152.

The overarching objective of these provisions, discernible from a holistic reading of article 47-*ter*, is to institute a system of transparency expressly designed to mitigate the risks inherent in algorithmic management. The structure of the information obligations has been meticulously crafted: the integration of the 1997 legislation, as updated by Legislative Decree of 27 June 2022, No. 104[958], has notably expanded the ambit of the rules governing transparent and predictable working conditions[959].

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[953] O. RAZZOLINI, "*I confini tra subordinazione, collaborazioni etero-organizzate e lavoro autonomo coordinato: una rilettura*", in DRI, 2020, n. II, pp. 345 ss.

[954] G. SANTORO-PASSARELLI, "*Il rapporto individuale di lavoro e il contratto collettivo nella normativa precedente al Codice, nel Codice civile del 1942 e nella disciplina successiva*", in DRI, 2022, n. 2, pp. 476 ss.

[955] P. TOSI, "*Le collaborazioni organizzate dal committente nel "decreto crisi'*"", in La Giustizia del Lavoro, 2019, n. 47, pp. 10 ss.

[956] L. DE ANGELIS, "*Su forma e prova del lavoro dei riders, anche nella pandemia*", in Labor, 2021, n. 1, pp. 59 ss.

[957] Article 47-*ter*, paragraph 1, of Legislative Decree No. 81/2015 provides that the "*individual employment contracts referred to in Article 47-bis must be evidenced in writing*".

[958] P. LOI, "*Garanzie e tutele per il lavoro digitale*", in U. CARABELLI-L. FASSINA (a cura di), La nuova legge sui riders e sulle collaborazioni etero-organizzate, Ediesse, 2020, pp. 107 ss.

[959] R. COSIO, "*Il caso Foodora tra giudici e legge*", in LDE, 2019, n. 3, pp. 2 ss.

At the European level, consideration had been given to extending these provisions to non-genuine autonomous workers[960]; Italian legislation, however, has ambitiously gone further, encompassing even genuine autonomous workers as defined under article 47-*bis*.

In sum, the legislation prescribes precise information obligations, aimed at diminishing the risks associated with the deployment of automated systems and algorithms for the monitoring and management of work performance.

These measures constitute a fundamental safeguard for workers operating within digital platforms, reinforcing the principles of transparency, predictability, and protection in modern labor relations.

Among the information that the client is required to provide, insofar as it is compatible[961], are details concerning the operation of automated decision-making systems, the objectives for which they are employed, and their potential impact on workers[962].

Further obligations are established regarding the protection of workers' health and safety, with particular emphasis on the conditions inherent to activities conducted through digital platforms[963]; in this respect, the legislation underscores the critical importance of transparency towards workers, in a context in which algorithmic management may directly influence task allocation, delivery times, and levels of remuneration.

These safeguards are reinforced by a dual enforcement framework.

On one hand, workers may appeal to the Labour Inspectorate in the event of non-compliance by the client with information obligations, potentially obtaining compensation calculated based on the severity of the violations and the wages earned in the preceding year[964].

On the other hand, the legislation, recognizing the evidentiary value of the written form of the contract, allows the worker, should the client fail to comply with the written form requirement, to rely on such omission as evidence to assert additional rights or a reclassification of the employment relationship, which could incorporate elements of subordinate employment.

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[960] See Recital No. 8 of Directive 2019/1152/EU, which states that "*Domestic workers, on-call workers, intermittent workers, voucher-based workers, platform workers, trainees, and apprentices may fall within the scope of this Directive provided they meet the criteria therein*".

[961] I. BRESCIANI, "*Le modifiche agli obblighi informativi nella disciplina delle prestazioni di consegna di beni mediante piattaforme digitali ex art. 47-bis, d.lgs. 81/2015 (art. 5, co. 2, lett. c, d.lgs. 104/2022)*", in D. GAROFALO, M. TIRABOSCHI, V. FILÌ, A. TROJSI (a cura di), Trasparenza e attività di cura nei contratti di lavoro. Commentario ai decreti legislativi n. 104 e 105 del 2022, ADAPT, pp. 299 ss.

[962] R. RIVERSO, "*Cambiare si può. Nuovi diritti per i collaboratori*", in Questione giustizia, 2019.

[963] R. VOZA, "*Il lavoro reso mediante piattaforme digitali tra qualificazione e regolazione*", in AA.VV., Il lavoro nelle piattaforme digitali, in Rivista Giuridica del Lavoro e della Previdenza Sociale, 2017, II, pp. 73 ss.

[964] See Article 47-*ter* of Legislative Decree No. 81/2015.

Lastly, article 47-*ter* is integrated with other provisions, such as article 1-*bis* of Legislative Decree No. 152/1997, thereby creating a comprehensive regulatory framework which, in addition to governing the use of digital technologies in work, affords broader protection to gig economy workers. These obligations, in essence, enhance both transparency and occupational health and safety, promoting greater clarity regarding working conditions and the rights to which workers are entitled[965].

[965] P. LOI, "*Garanzie e tutele per il lavoro digitale*", *cit*., pp. 107 ss.

CHAPTER SIX

International public and private instruments for the protection of health and safety in platform work: an analysis of global policies and practical guidelines.

1. Introduction.

The development of new technologies within work organisations, particularly those relating to the use of artificial intelligence in digital platform work, has drawn attention not only to the benefits they offer but also to the risks they pose to workers' health and safety, which must be carefully prevented and managed.

By way of example, as previously noted, such risks include work intensification, job insecurity and the phenomenon known as *technostress*[966], arising from the continuous pressure placed upon workers to adapt to the pace imposed by technological systems[967]. Moreover, the almost total absence of a balance between work and private life, stemming from the very modalities through which platform workers perform their duties, often leads to burnout, while invasive surveillance and constant monitoring by platforms may, without question, result in privacy violations and a loss of professional autonomy.

Furthermore, decision-making processes based on AI systems may entail additional risks, such as the fragmentation of tasks, a decline in job satisfaction and a diminished sense of purpose, as well as the marginalisation of certain categories of workers, thereby exacerbating inequalities in the workplace[968].

Although, as examined in previous chapters, the existing regulatory frameworks, both at European level and within individual Member States, have to some extent sought to introduce protective mechanisms and mitigation strategies, significant gaps nonetheless remain, particularly within the United Kingdom.

Consequently, beyond the need for legislative reform to address such deficiencies, there is an urgent requirement for the establishment of voluntary standards, the implementation of targeted training programmes, and the promotion of awareness campaigns[969] designed to

[966] A. UMAIR, K. CONBOY, E. WHELAN, "*Examining technostress and its impact on worker well-being in the digital gig economy*", in Emerald, 2023.
[967] ILO, "*La gestione algoritmica del lavoro e le sue implicazioni in diversi contesti*", in ILO, 2022.
[968] ILO, "*Revolutionizing health and safety: The role of AI and digitalization at work*", in ILO, 2025, p. 5.
[969] ILO, "*Revolutionizing health and safety: The role of AI and digitalization at work*", *cit.*, 2025, p. 35.

guide enterprises and provide workers with the necessary tools to engage safely with new technologies. According to a study conducted by the ILO, "*the continuous assessment and management of risks are essential to effectively confront emerging threats; this entails the regular evaluation of hazards associated with new technological devices, the implementation of preventive measures consistent with the established hierarchy of controls in the field of occupational health and safety, and the ongoing adaptation of health and safety policies in accordance with technological evolution, incorporating both workers' feedback and advancements in safety practices. In this regard, there already exist AI-driven digital tools, real-time monitoring systems and predictive models capable of enhancing risk assessment and safety strategies. Nonetheless, such tools must be designed to complement rather than replace human evaluation within health and safety practices*.

Accordingly, workers, and particularly their representatives, deserve to be actively involved in all phases of technological implementation, including design, operation and monitoring, so as to ensure that these systems contribute to the improvement, rather than the erosion, of occupational health and safety.

Thus, through the adoption of a collaborative and worker-centred approach, stakeholders may foster the integration of digital innovation with safer, healthier and more sustainable working environments, thereby ensuring outcomes that are beneficial for all parties concerned"[970].

2. ***International policies on health and safety in digital workplace.***

2.1. The role of the International Labour Organization (ILO).

Having laid the foregoing premises, it must be observed that, in order to ensure the right, which also assumes the status of a fundamental principle, to a working environment that is as healthy and safe as possible, it is necessary, as a preliminary step, to address the challenges of a constantly evolving world of work.

[970] ILO, "*Revolutionizing health and safety: The role of AI and digitalization at work*", *cit*., p. 9. About the topic, see also NATIONAL INSTITUTE FOR OCCUPATION HEALTH AND SAFETY, "*Hierarchy of controls*", in NIOSH, 2024; S. VARGOVA et al, "*Risk Assessment of the Implementation of Digital Elements Applied to Occupational Health and Safety*", in Chemical Engineering Transaction, 2024, vol. 111, pp. 229 ss; T. TAGAREV et al, "*Integrating the Risk Management Cycle*", in Researchgate, 2021; J. BERG et al., "*Rischi per la qualità del lavoro derivanti dalle tecnologie digitali: le relazioni industriali in Europa sono pronte per la sfida?*", in EJIR, 29(4), pp. 347-365.

The risks arising within it, including those introduced by digitalisation, must be managed in parallel and with the same degree of rigour (if not greater) as those already existing, which requires a profound understanding and mitigation of such risks.

In this regard, according to the aforementioned study conducted by the ILO, "*the fundamental conventions on occupational health and safety, in particular Convention No. 155 on Occupational Safety and Health (1981) and Convention No. 187 on the Promotional Framework for Occupational Safety and Health (2006), have sought to provide a comprehensive framework aimed at ensuring a systemic and flexible approach to occupational health and safety, capable of adapting to the evolving nature of workplace risks. Specifically, while Convention No. 155, widely regarded as the most comprehensive of the instruments currently in force, defines the objectives and guiding principles of a national policy consistent with occupational safety and health requirements and applies to all workers across sectors, Convention No. 187 is designed to promote the continuous improvement of national regulatory frameworks on occupational health and safety, ensuring that state policies remain responsive to transformations in the world of work, including those driven by digital transition.*

Member States, pursuant to article 4 of Convention No. 155, are required, in consultation with the most representative organisations of employers and workers, to formulate, implement, and periodically review a coherent national policy on occupational health and safety, the purpose of which is to prevent occupational accidents and injuries by eliminating or minimising their underlying causes"[971].

When viewed within the context of digitalisation and the ever-evolving landscape of work, this principle calls for the integration of occupational health and safety policies with the challenges and opportunities posed by emerging technologies, thereby defining measures for the assessment and mitigation of related risks.

Furthermore, article 4(3) of Convention No. 187 emphasises the role of tripartite bodies in fostering a culture of prevention in occupational health and safety, actively engaging all

[971] ILO, "*Revolutionizing health and safety: The role of AI and digitalization at work*", *cit*., 2025, pp. 35-36. About this topic, see also A. ZANOBETTI, "*Recognition of a Safe and Healthy Working Environment as a Fundamental Principle at Work*", in Università di Bologna, 2022; INTERNATIONAL LABOUR OFFICE GENEVA, "*ILO standards on occupational safety and health Promoting a safe and healthy working environment*", in ILO, 2009; ILO, "*Implementing a safe and healthy working environment: Where are we now?*", in ILO, 2023; H. HAMZAOUI, "*Occupational Safety and Health as Fundamental Right at Work: The Facts, The Challenges*", in Austin Publishing Group, 2024.

relevant stakeholders, from governments to employers' associations and trade unions. Such bodies play a pivotal role in addressing the new technological instruments being introduced into workplaces, ensuring the adoption of appropriate preventive measures.

Workers, under article 13 of Convention No. 155, enjoy the right to withdraw from situations that could reasonably be expected to present a serious danger to their life or health, a right which may, by extension, be invoked in the face of risks arising from new technologies.

Employers, for their part, pursuant to article 16 of the same Convention, are obliged to ensure, so far as is reasonably practicable, that machinery, equipment, and processes under their control do not pose risks to health or safety.

This duty likewise extends to digital tools and automated systems, in relation to which employers must be capable of identifying and managing potential risks, including those associated with human-machine interaction, system malfunction, and ergonomic or psychosocial issues stemming from digitalisation.

The same Convention, in article 19, underscores the importance of providing workers with adequate education and training. However, this principle proves challenging to apply in practice with the advent of new technologies such as artificial intelligence and augmented reality. Moreover, articles 19 and 20, together with the aforementioned Convention No. 187, establish a form of cooperation between employers and workers in the implementation and management of occupational health and safety measures, both at national and enterprise levels.

This collaboration seeks to ensure the inclusiveness of health and safety policies, thereby enabling a more effective response to the challenges posed by digitalisation and achieving an equilibrium between technological progress and the protection of workers' health and safety.

Beyond the fundamental conventions, other instruments in the field of health and safety also contain provisions and guidance that are particularly relevant to improving aspects of health and safety affected by digitalization; for instance, the *Occupational Health Services Convention* (No. 161) of 1985 emphasises the role of occupational health services in identifying and assessing workplace risks, and in providing guidance on work organisation, including work design and the use of machinery, tools, and equipment.

Similarly, the Recommendation No. 194 of 2002 concerning the *List of Occupational Diseases* recognises illnesses caused by physical, chemical, and biological agents, as well as musculoskeletal, mental, and behavioural disorders, all of which may assume growing importance in the context of digitalisation.

It can be emphasized that, while the International Labour Organization Recommendation No. 194 of 2002 addresses mental health[972], Commission Recommendation (EU) 2022/2337 merely encourages research into psychosocial risks[973], which may or may not lead to mental health problems. This is, in fact, leading to amendments to the legislation of certain Member States, including Spain (such as Royal Decree 1299/2006[974]).

Nor could the Violence and Harassment Convention (No. 190) of 2019 be overlooked, as it seeks to establish a framework for the prevention and mitigation of violence and harassment in the world of work, including those occurring through the use of digital technologies, which may also serve, to some extent, as tools to prevent phenomena such as cyberbullying.

It is also worth noting that during the 113th (2025) and 114th (2026) Sessions of the International Labour Conference[975], a new standard on decent work in the platform economy will be discussed, incorporating health and safety considerations.

Further regulatory developments are also anticipated in the areas of ergonomics and machinery safety[976].

Completing this framework are several technical guidelines and codes of practice issued by the ILO, among which the *Code of Practice on the Protection of Workers' Personal Data* stands out[977], providing particularly pertinent guidance for a world of work increasingly characterised by the large-scale processing of workers' data.

The ILO continues to examine the challenges and opportunities arising from the digital transformation of work through a range of initiatives designed to support governments, employers' organisations, and trade unions in managing these developments.

In this respect, particular reference could be made, on the one hand, to the ILO's *Global Strategy on Occupational Safety and Health 2024–2030*[978], which highlights the need to identify effective tools for addressing both the opportunities and challenges associated with new technologies; and, on the other hand, to the *Observatory on Artificial Intelligence and*

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[972] See, for example, *R194 List of Occupational Diseases Recommendation*, 2002, in ILO; S. CANEVE, I. FIORE, "*Rischi psicosociali, salute mentale e organizzazione del lavoro nell'ultimo report dell'OIL*", in Bollettino Adapt, 2026.

[973] Art. 1, para. 7, of the COMMISSION RECOMMENDATION (EU) 2022/2337 of 28 November 2022 concerning the European schedule of occupational diseases, in Publications Office.

[974] A.A.V.V., "*Work and mental health: a roadmap for health administrations in Spain*", in Work_and_mental_health_a_roadmap.pdf, 2025, pp. 60-61.

[975] OIL, "*Decision concerning the agenda of the future sessions of the International Labour Conference*", GB.347/INS/2/1/DECISION, 2023.

[976] OIL, "*The Standards Initiative: Report of the third meeting of the Standards Review Mechanism Tripartite Working Group*", in OIL, 2017.

[977] OIL, "*Code of practice: protection of worker's personal data*", in OIL, 1997.

[978] OIL,"*Global Strategy on Occupational Safety and Health 2024–30 and plan of action for its implementation*", in OIL, 2023.

Work in the Digital Economy, which serves as a key reference point for governments and social partners in understanding and managing digital transformations in the world of work[979]. Lastly, the ILO's *Social Dialogue Report 2024: Peak-level Social Dialogue for Economic Development and Social Progress* emphasises the pivotal role of social dialogue in managing the transformations brought about by digitalisation.
It highlights the importance of collaboration between governments, employers, and workers in securing fairer outcomes and ensuring decent work in the digital era[980].

2.2. Global policy initiatives and social dialogue on digital labour and artificial intelligence.

Beyond the efforts undertaken by the ILO to ensure, through the provisions set out in the aforementioned Conventions, the protection of workers in the face of technological change, attention must also be given to other international initiatives which, much like those Conventions, aim to address the challenges posed by new technologies in the world of work. By way of example, the *G7 Action Plan*, adopted under the Italian Presidency in 2024, seeks to promote the development and deployment of safe, secure, reliable, and human-centred artificial intelligence tools; this initiative underscores the importance of enforcing labour legislation and occupational safety and health standards, as well as monitoring the impact of AI on health and safety, including through risk assessments and audits. Wheighty initiatives are also emerging from international employers' and workers' organisations, which seek to respond to the opportunities and challenges arising from digitalisation in the workplace.
In particular, the *International Organisation of Employers* (IOE) advocates for skills development and training to ensure a workforce adequately prepared to navigate digital transformation, recognising the need to integrate OSH considerations into the implementation of new technologies.
Within this framework, the IOE has issued several reports, including *Mental Health and Well-being at Work* (2023), which examines mental health within the broader context of workplace digitalisation and the integration of emerging technologies.

[979] At present, four thematic areas are being addressed, namely artificial intelligence, investment management, digital labour platforms, and workers' personal data, although a future expansion to additional areas is envisaged.
[980] ILO, "*Revolutionizing health and safety: The role of AI and digitalization at work*", *cit.*, pp. 37-38.

Furthermore, in 2024, the IOE conducted a policy analysis examining in depth the impact of AI on work and employment, highlighting its potential for enterprises while offering strategic guidance to employers on the adoption and effective management of AI technologies.

Lastly, the IOE, in collaboration with *Deloitte*, published a major report in preparation for the 2024 G20, entitled *AI-Powered Transformation*[981], which emphasises that while AI represents a key driver of productivity and efficiency, it also brings with it significant risks, such as job displacement and the exacerbation of inequalities, which must be addressed through proactive and forward-looking measures.

In this regard, international trade unions have proven particularly proactive in addressing the consequences of digitalisation for workers.

Indeed, the *International Trade Union Confederation* (ITUC) has sought to establish stricter regulation of artificial intelligence and digital surveillance to protect workers from discrimination and intensification of work[982], while simultaneously promoting occupational health and safety and the right to collective bargaining for platform workers affected by digitalisation.

A notable report by *UNI Global Union*, *Algorithmic Management – A Trade Union Guide*[983], demonstrates that an analysis of the increasing use of algorithmic management tools in workplaces worldwide has provided unions with guidance on how to negotiate their development and implementation[984].

Regional employers' organisations have also engaged in discussions regarding the importance of responsible use of technological tools in the workplace.

In particular, *BusinessEurope* has emphasised the development of skills and training as a response to the impact of AI and automation, advocating the implementation of regulatory frameworks to support companies in adapting to digitalisation, including the management of mental health risks associated with remote work and automation[985].

Trade unions, for their part, have contributed by preparing reports to guide policy development, launching awareness campaigns, and providing training initiatives; for example, the *European Trade Union Confederation* (ETUC), through its *Resolution on European AI*

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[981] IOE, DELOITTE, "*G20 2024 Readiness Report: AI Powered Transformation*", in International Organisation of Employers, 2024.

[982] ITUC, *"AI IS NOT OK | Union action needed on Artificial Intelligence (AI) at work"*, in ITUC, 2025.

[983] UNI GLOBAL UNION, "*Algorithmic management-a trade union guide*", in UNI Global Union, 2020, p. 24.

[984] ILO, "*Revolutionizing health and safety: The role of AI and digitalization at work*", *cit.*, p. 38.

[985] A noteworthy publication is the report *Algorithmic Management at Work: Improving Transparency to Achieve More Trust in AI*, which seeks to explore methods for fostering trust in AI-based systems.

and Data Strategies published in 2020[986], has promoted greater worker participation in AI governance and decision-making processes.

The resolution stresses the need to protect workers[987], advocating that AI applications affecting them be classified as high-risk and, therefore, subject to stricter regulation to uphold the precautionary principle.

The *European Trade Union Institute*, meanwhile, published the report *Regulating Algorithmic Management*[988], which evaluated the (now approved) European Commission proposal on improving platform work conditions.

The report argues that fair and transparent algorithmic management should be ensured by strengthening workers' ability to exercise fully their rights of access, rectification, erasure, restriction of processing, and data portability.

Moreover, the Institute's education unit has developed a series of programmes and tools to introduce AI to workers' representatives[989].

Focusing on the increasingly prevalent spread of telework and digital platform work, it is evident that several countries have introduced specific legislation designed to address modes of performing work that, as previously observed, are in constant evolution due to the use of digital technologies[990]. In particular, some of these legislative measures concern digital platform work, although approaches have not always been consistent.

While certain regulations have concentrated on the legal nature of the employment relationship, often in terms of subordination or hybrid forms that nevertheless allow an extension of typical protections for employees, others aim to provide specific safeguards, including those relating to occupational health and safety, for all platform workers irrespective of legal classification; this has had notable implications regarding the levels of responsibility imposed on the platforms themselves.

In some instances, such responsibility has been explicitly assigned to the platforms, whereas in others it has been shifted onto the workers. In other words, while digital work platforms are

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[986] CES, "*Risoluzione sulle strategie europee in materia di intelligenza artificiale e dei dati*", in UIL.it, 2020.

[987] In this context, the resolution emphasises the prevention of surveillance that is often excessive and undue in the workplace, the prohibition of discriminatory treatment based on biased algorithms, and the prevention of abuses regarding data protection and privacy.

[988] ETUI, "*Regulating algorithmic management: An assessment of the EC's draft Directive on improving working conditions in platform work*", in Etui, 2022.

[989] ETUI, "*Empowering workers: ETUI's training tools on AI's impact in the workplace*", in Etui, 2024.

[990] It should be noted that many platforms tend to frame their operations as technological intermediaries, thereby classifying platform workers as self-employed. This assumption clearly raises numerous questions concerning responsibility for essential risk-prevention measures, such as risk assessments, occupational health and safety training, and the provision of personal protective equipment. In practice, there are several instances where such obligations are either unclear under current legislation or shifted onto the workers, who often lack the resources to comply. See OIL, "*Realizzare un lavoro dignitoso nell'economia delle piattaforme*", in OIL, 2024c.

expected to conduct risk assessments concerning automated decision-making and monitoring systems to safeguard the physical and mental health of platform workers, it is noteworthy that, initially, such provisions were not applicable to "*persons performing work via digital platforms who do not have a contract of employment or an employment relationship*", given that EU directives on health and safety traditionally pertain solely to employees[991], thereby leaving such responsibility with the workers themselves.

Indeed, starting from the definition of a "*digital platform worker*", understood as "*any person performing work via digital platforms who has, or is considered to have, a contract of employment or an employment relationship as defined by law, collective agreements, or practices in force in the Member States, taking into account the case law of the Court of Justice*" (art. 2, para. 1, lett. d), it becomes clear that even self-employed workers should be deemed deserving of such protections, insofar as a contractual basis underlies their work. Reference to the definition of "*worker*" in art. 3, lett. a, of Framework Directive 89/391/EEC is particularly instructive, as it applies to "*any person employed by an employer, including trainees and apprentices, but excluding domestic workers*"[992].

Furthermore, it should be emphasised that, particularly for those for whom platform work constitutes the primary source of income, economic instability may frequently give rise to difficulties that, although concerning their working conditions, also affect occupational health and safety[993]. In this regard, the pursuit of new work opportunities, while understandable in itself, may have direct effects on the worker's physical and mental well-being, while such workers may also be incentivised to economise on the tools required for their work, thereby exposing themselves to increased risks.

2.3. Collective bargaining, labour inspection and trade union action in the digital era.

Supporting national legislation, collective agreements also play a crucial role, offering additional protections at sectoral or company level.

Some of these agreements focus on specific technologies, such as exoskeletons, artificial intelligence, or algorithmic management, while others adopt a considerably broader approach;

[991] Specifically, reference is made to Recital 54, which provides that "*the rights in relation to health and safety at the workplace, as well as the rights to information and consultation of digital platform workers or their representatives, which specifically concern employees under Union law, should not apply to persons performing work via digital platforms who do not have an employment relationship*".

[992] For the protection of the health and safety of self-employed workers, see also the Council Recommendation of 18 February 2003, No. 2003/134/EC.

[993] E. DAGNINO, "*Uber law: prospettive giuslavoristiche sulla sharing/on-demand economy*", in DRI, 2016, pp. 145 ss.

for example, in the Spanish context, the 2023–2024 *Teknikerm* collective agreement sought to guarantee employees' right to disconnect, encompassing rest periods and privacy, and prohibiting work-related communications outside working hours, except under exceptional circumstances[994].

Other agreements target sector-specific concerns. In Italy, trade unions representing workers in commerce, tourism, and services[995] concluded an agreement with Partesa, a subsidiary of the multinational beer group *Heineken*, to regulate the use of an app designed for monitoring delivery drivers. The agreement limited the app's use to safety and productivity purposes, requiring prior approval from the union or works council before implementation[996].

In the United Kingdom, the *GMB* union reached an agreement with Hermes regarding the deployment of algorithm-driven processes used by the company to manage its delivery fleet. Essentially, this accord empowers unions to conduct health and safety assessments following incidents, thereby recording cases where algorithmic management adversely affects safety[997].

Labour inspectorates also perform a vital function in ensuring compliance with health and safety regulations, including in the context of digitalisation. Beyond enforcing legal provisions, they provide essential guidance to both employers and workers, enabling them to navigate and implement the necessary safety measures in increasingly dematerialised workplaces. Moreover, while inspectorates seek, through inspections, training, and dialogue, to prevent technological progress from undermining worker health and safety, they simultaneously harness technology and AI to optimise priorities and set objectives, employing algorithms that identify signals of non-compliance or potential fraud.

Campaigns to raise awareness and develop resources spearheaded by trade unions also play a pivotal role in ensuring that worker health and safety remains a priority amid the adoption of new technologies. These initiatives focus, for example, on promoting a digital transition that safeguards workers' rights while simultaneously ensuring healthier, safer, and more inclusive workplaces in a continually evolving technological environment. In Spain, for instance, the trade unions *Comisiones Obreras* (CO) and *Unión General de Trabajadores* (UGT) have produced reports to support collective bargaining and raise awareness among company boards regarding algorithmic management and data protection. Their work contributed to the

[994] S. BRUNNEROVA' et al., "*Pratiche di contrattazione collettiva sull'intelligenza artificiale nei settori dei servizi europei*", Bruxelles: FES Competence Centre on the Future of Work, 2024.

[995] Filcams CGIL (Italian Federation of Workers in Commerce, Hotels, Canteens and Services) and Fisascat CISL (Italian Federation of Trade Unions for Workers in Commercial, Related Services and Tourism Sectors).

[996] S. BRUNNEROVA', "*Pratiche di contrattazione collettiva sull'intelligenza artificiale nei settori dei servizi europei*", *cit*.

[997] P. COLLINS, J. ATKINSON, "*La voce dei lavoratori e la gestione algoritmica nella Gran Bretagna post-Brexit*", in European Review of Labour and Research, 2023, 29 (1), pp. 37-52.

publication of "*Trade Unions in the Digital Era: National Profile on the Spanish Manufacturing Sector"*[998], which addresses digital skills training for both workers and unions.
The United Kingdom has demonstrated similar commitment.
The Trades Union Congress (TUC) published "*Shaping Our Digital Future"*[999], analysing the role of collective bargaining in the context of technological innovation.
The report highlights the need to protect workers from undue performance pressures and constant monitoring, often associated with AI-driven workplaces.
Furthermore, it forms part of the broader manifesto "*Dignity at Work and the AI Revolution"*[1000], which emphasises a fairer and more transparent use of AI, drawing attention to concerns surrounding job security, working conditions, and mental health.

3. ***Workers' participation and proactive risk management in the integration of new technologies.***

An aspect deemed essential for ensuring effective workplace action is the active participation of workers, which appears vital to guarantee the design and implementation of new technologies in support of occupational health and safety.
In this regard, given the ability of new technological tools to shape the nature of work, it is evident that workplaces must implement measures specifically designed to address emerging risks, the particular needs of the existing workforce, and, naturally, the challenges posed by technological advancement; only through the adoption of proactive strategies can organisations implement technology that genuinely enhances, rather than compromises, the safety and well-being of workers.
Within workplaces, digitalisation, as previously analysed, can undoubtedly bring about substantial changes, such as those related to automation or digital monitoring.
Therefore, to maximise opportunities, it could be desirable to adopt a collaborative approach[1001], whereby workers and their representatives are actively engaged in the development of effective measures and solutions. In other words, workers could be

[998] D.T.K. CARRILLO, R.M. MUKIUR, "*Trade Unions in the digital age: country fiche on spanish manufacturing sector*", in Bollettino Adapt, 2021, 2.
[999] TUC, "*Shaping on our Digital future: a Tuc discussion paper*", in TUC: Trade Union Congress, 2017.
[1000] TUC, "*Dignity at Work and the AI Revolution: a Tuc manifesto*", in TUC: Trade Union Congress, 2021.
[1001] A. ALAIMO, "*Il coinvolgimento dei lavoratori nell'impresa: informazione, consultazione e partecipazione*", *cit*; M.T. CARINCI, S. GIUDICI, P. PERRI, "*Obblighi di informazione e sistemi decisionali e di monitoraggio automatizzati (art. 1-bis "Decreto Trasparenza"): quali forme di controllo per i poteri datoriali algoritmici?*", *cit*.

involved[1002] in every phase of technology implementation, including selection, definition of roles and objectives, introduction, and ongoing review. In doing so, workers and employers, through dialogue[1003] and cooperation, can develop strategies for the safe use of digital technologies, ensuring that such advances support workers' health and safety; in this context, the establishment of effective OSH management systems is essential to proactively address the risks introduced by digitalisation and artificial intelligence.

In this respect, it goes without saying that the active involvement of workers and their representatives serves both to mitigate the unilateral nature of managerial prerogatives and to ensure the effective protection of workers' rights. From this perspective, the implementation of measures aimed at promoting so-called organisational well-being, including through concertative mechanisms, can only be effective insofar as workers are genuinely enabled to influence the organisation of work. In this context, the establishment of effective OSH management systems is essential to proactively address the risks introduced by digitalisation and artificial intelligence[1004].

Furthermore, it could be observed that the increasing integration of AI tools within organisations must be implemented through consultation with workers and their representatives at every stage, within a robust OSH management framework, which must remain a priority.

In this regard, the ILO Guidelines on *Occupational Safety and Health Management Systems* ("*ILO-OSH 2001*") can be considered, as they are founded upon key principles such as the formulation of a clear OSH policy (in line with the aforementioned ILO Convention No. 155) that emphasises the organisation's commitment to health and safety, particularly when integrating new technologies. Secondly, such integration necessitates the proper definition of roles and responsibilities regarding health and safety, ensuring management commitment and promoting active participation and consultation of workers.

Thirdly, it is essential to identify hazards and evaluate all risks, including those arising from new technologies such as AI and digital tools, implementing preventive and protective measures to address these innovations.

Fourthly, it is recommended that continuous monitoring and measurement of health and safety performance be undertaken, including the effectiveness of controls related to new

[1002] EU-OSHA, "*Worker participation and representation: the impact on risk prevention of AI worker management systems*", in Eu-Osha, 2024.
[1003] J. ATKINSON, P. COLLINS, "*Worker Voice and Algorithmic Management in Post Brexit Britain*", *cit*.
[1004] Author's note.

technologies, through regular audits, in order to ensure compliance with health and safety standards.

Fifthly, corrective actions could be implemented, focusing on assessments and the continuous improvement of health and safety; this also encompasses a review of health and safety policies and procedures to address the constantly evolving risks arising from technological changes in the workplace[1005].

3.1. Representation, participation and training in addressing emerging risks.

As previously noted, a key element in ensuring a safe and healthy working environment is the imperative that workers, on the one hand, are adequately informed about the use of new technological tools and the potential risks they entail, and, on the other, are actively involved in the implementation of preventive measures; this is corroborated by an extensive body of literature, which has demonstrated how worker representation structures can have a positive impact in mitigating the effects of psychosocial risks in the workplace[1006].

Specifically, worker representatives, while capable of providing managers with crucial insights to identify the concrete risks that employees may encounter, some of which may be unknown to management, can also contribute to the development of innovative solutions aimed at preventing such risks, while ensuring adequate protection of workers' privacy. Research has further shown that organisations that actively support worker[1007] representation structures are more likely to mitigate and prevent the adverse effects of AI on occupational health and safety and working conditions[1008].

An important consideration, however, is that work management technologies based on artificial intelligence (hereinafter AIWM) can often influence the technical capacities and authority of existing worker representation structures.

While such structures may mediate the psychosocial risks associated with AIWM on working conditions and health and safety, they are simultaneously affected by these technologies,

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[1005] ILO, "*Revolutionizing health and safety: The role of AI and digitalization at work*", *cit*., p. 55 ss.

[1006] D. WALTERS, "*Worker representation and psycho-social risks: A problematic relationship?*", in Safety Science, 2011, 49(4), pp. 599–606; R.P. CASTIBLANQUE, A. PIZZI, "*Presencia sindical y gestión de riesgos laborales de origen psicosocial. Un análisis del caso español*", in Revista Internacional de Organizaciones, 2020, (24), pp. 325-366.

[1007] A.a.V.v., "*Algorithmic management in the workplace. Case studies on the impact of algorithmic technologies in seven sectors in the Nordics*", in Foundation for European Progressive Studies, 2024.

[1008] EU-OSHA, "*AI in worker management: involving people to prevent risks*", in Eu-Osha, 2025; EU-OSHA, "*Worker participation and representation: the impact on risk prevention of AI worker management system*", in Eu-Osha, 2024.

which can undermine their effectiveness in identifying and preventing such risks. Indeed, it has been highlighted that AIWM technologies may impact the ability of social partners to implement the benefits and reduce the risks of AI for both workers and employers through social dialogue[1009].

AIWM presents at least three distinct challenges to worker representation structures.

The first relates to the integration of AIWM technologies into the workplace, which can, at times, overshadow these structures. This contributes to a lack of awareness among both workers and their representatives regarding the implications for health and safety. Even where employers fulfil their information obligations, representatives may not have full visibility of all the risks associated with these technologies.

Although numerous regulations mandate the provision of information regarding the use of algorithms and AI-based technologies, ensuring compliance is far more challenging due to the inherent complexity of these systems; as has been correctly observed[1010], even when workers and their representatives are aware of data collection via various tools, they may not necessarily understand how such data are used.

The second challenge concerns the opacity of AIWM technologies.

A significant portion of AI-based systems are proprietary and operate, as previously emphasized, as "*black boxes*", whose internal mechanisms are neither visible nor comprehensible to external observers; this undoubtedly hinders worker representatives from contesting or verifying the fairness and accuracy of these systems and the decisions derived therefrom. Understanding the contents of this algorithmic "*black box*" constitutes a preliminary, if not essential, condition for ensuring accountability and effective regulation[1011]. Indeed, such an opportunity could be realised through granting workers and their representatives access to the algorithms underpinning these technological systems. However, while this constitutes a necessary condition, it is by no means sufficient to ensure that the aforementioned parties can effectively assert their rights and prevent the adverse effects generated by these technologies.

This could be accompanied by the development of adequate technical capabilities to foster a deeper understanding of the algorithms, given that, as previously noted, the interpretation and

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[1009] C. KRAMER, S. CAZES, "*Shaping the transition: Artificial intelligence and social dialogue*", in OECD, 2022.

[1010] O. MOLINA et al., "*It takes two to code: A comparative analysis of collective bargaining and artificial intelligence*", in European Review of Labour and Research, 2023, 29(1), pp. 87–104.

[1011] S. MOUGDIR, "*What is in the black box: The ethical implications of algorithms and transparency in the age of the GDPR*", in AIRWA, 2024, 3(1), pp. 90-100.

negotiation regarding the use of AIWM systems presents considerable technical challenges for workers' representatives[1012].

These issues stem from the inherent complexity of the technology, the lack of transparency, and the high level of technical expertise required to comprehend and effectively challenge algorithmic systems. In particular, systems employing machine learning and artificial intelligence are based on complex mathematical models and programming[1013], necessitating highly specialised knowledge, the full comprehension of which is far from straightforward for workers' representatives[1014].

Consequently, they are often unable to evaluate how specific decisions are made or to contest potentially unfair or discriminatory algorithmic practices[1015].

Furthermore, when companies designate the algorithms and data used as proprietary, access is understandably restricted, typically in the interests of commercial confidentiality or data privacy[1016].

Lastly, the third obstacle to be considered relates to the power imbalance inherent in the employment relationship. The greater this imbalance, the lower the prospects of reaching negotiated solutions to the challenges posed by AIWM, due to employers' concerns regarding competitiveness and managerial control. This dynamic is particularly evident in the platform economy, notably within food delivery platforms, where traditional forms of worker representation are fragmented or sparsely developed, creating an inevitable barrier to collective action aimed at addressing psychosocial risks[1017].

For completeness, it should be noted that a similar situation can also be observed in SMEs, where worker representation structures are often minimal and unionisation levels are low. This enables employers to implement AIWM technologies unilaterally with relative ease, compounded by workers' reluctance to challenge or report such practices.

To address the aforementioned issues, reference may be made to ILO Convention No. 155, which underscores the critical importance of thoroughly consulting workers and their

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[1012] EU-OSHA, "*Real-world learnings for implementing worker management through AI*", in Eu-Osha, 2025; EU-OSHA, "*AI in worker management: involving people to prevent risks*", in Eu-Osha, 2025.

[1013] E. BARBIERATO, "*The challenges of machine learning: a critical review*", in MDPI, 2024; P. BORRELLAS, I. UNCETA, "*The Challenges of Machine Learning and Their Economic Implications*", in MDPI, 2021, 23(3).

[1014] P. IERVOLINO, "*Osservazioni sulla decodificazione algoritmica*", in AmbienteDiritto, 2024.

[1015] CENTRE FOR DATA ETHICS AND INNOVATION, "*Review into bias in algorithmic decision-making*", in Gov.Uk, 2020.

[1016] A. VEDDER, L. NAUDTS, "*Accountability for the use of algorithms in a big data environment*", in IRLCT, 2017, 31(2), pp. 206–224.

[1017] A.J. WOOD et al., "*Good gig, bad gig: Autonomy and algorithmic control in the global gig economy*", in JRC, 2019, 33(1), pp. 56–75.

representatives prior to the introduction of new technologies that may impact occupational health and safety. Such consultation ensures that they can intervene effectively regarding decisions that might directly affect their work activities.

This form of consultation must be proactive, providing workers with the opportunity to express concerns, offer feedback, and influence decisions concerning the implementation and management of new technologies in the workplace.

Research has demonstrated that active worker participation in decision-making processes can markedly improve both safety outcomes and acceptance of new technologies[1018]. In this regard, consultation and participation serve as supportive mechanisms for workers, enabling them to adapt more confidently to new systems. Equally, the acquisition of knowledge and skills by workers and their trade union representatives is fundamental in identifying efficient solutions.

This approach helps to detect risks that may not be fully apparent during planning or design phases and ensures that solutions are tailored to the actual needs of the workforce.

Such an health and safety culture, as envisioned by the ILO Convention n. 155, positions worker involvement as a valuable resource. It allows workers to assume partial responsibility in shaping the work environments in which they operate, while simultaneously obliging employers to ensure that consultation processes are inclusive and attentive to the genuine needs of the workforce. Moreover, a culture of worker consultation and participation facilitates the reporting of potential hazards without fear of retaliation, contributing to the timely and effective identification and elimination of risks, thereby promoting a shared commitment to workplace safety and well-being.

Furthermore, to make the level of participation and the safe implementation of digital technologies even more concrete, employers are required to provide comprehensive and ongoing training. Such training must equip workers with the necessary knowledge and skills, including an understanding of operational procedures, recognition of potential risks, application of preventive measures, and the capacity to respond to malfunctions or emergencies.

Training should be continuous and adapt to technological evolution as well as changes in work practices that arise as a result. Employers are therefore obliged to provide appropriate

[1018] EU-OSHA, "*Tecnologie digitali sul lavoro e rischi psicosociali: prove e implicazioni per la sicurezza e la salute sul lavoro*", in Eu-Osha, 2024b.

and up-to-date training, which is accessible and comprehensible to all workers, taking into account factors such as linguistic diversity and varying levels of literacy[1019].

4. ***Integrated risk assessment in the digital transition of work: collective participation, technological complexity, and perspectives for the protection of health and safety.***

Another aspect deserving particular attention concerns the integrated assessment of risks within the digital transformation of work, which calls for the adoption of an increasingly participatory approach capable of actively involving workers and their representatives. Contemporary occupational health and safety risk assessment extends well beyond traditional material hazards, encompassing risks arising from digitalised processes and the use of artificial intelligence, including their psychosocial implications[1020]. Within this context, the need emerges for a dynamic and continuous form of risk assessment[1021], capable of adapting to ongoing technological developments. In this regard, a central role is played by ISO standards, particularly ISO 31000 and ISO 45001, which provide a systemic approach to risk management focused on organisational processes, communication, and stakeholder involvement. More specifically, with reference to artificial intelligence, ISO/IEC 42001, 23894, and 42005 introduce advanced models of AI risk management and impact assessment. Such frameworks are grounded in principles of accountability, transparency, fairness, data protection, reliability, safety, and sustainability, while simultaneously focusing on the ethical and social effects generated by AI systems. These standards structure the assessment process through the phases of risk identification, analysis, and evaluation, while also considering the impact of AI on individuals, organisations, and society as a whole[1022].

With regard to the phase concerning risk identification, it should first be observed that psychosocial risks derive from the ways in which work activities are designed, organised, and supervised, as well as from the impact of corporate policies and procedures on everyday operational dynamics. These factors determine whether work is carried out under conditions of stability, predictability, and adequate resource availability.

[1019] ILO, "*Revolutionizing health and safety: The role of AI and digitalization at work*", *cit.*, 2025, pp. 55-56.
[1020] ILO, "*Revolutionizing health and safety: The role of AI and digitalization at work*", *cit.*, 2025, pp. 56-57.
[1021] R. JAIN et al., "*Meeting the future: Dynamic risk management for uncertain times*", in Mckinsey&Company, 2020.
[1022] F.P.F. PONTANI, "*Valutazione del rischio e dell'impatto dei sistemi di IA: regole operative*", in Valutazione del rischio e dell'impatto dei sistemi di IA: regole operative - Cyber Security 360, 2024, pp. 2 ss.

Conversely, situations characterised by excessive workloads, role ambiguity, interpersonal conflicts, or perceptions of unfairness may generate adverse consequences for workers.

Since psychosocial risks are not always immediately detectable, it becomes necessary to rely upon a broader range of informational sources. In this respect, organisational documentation, job descriptions, and management procedures may provide valuable indications regarding the ways in which such risks emerge and interact; for example, staff shortages may lead to increased workloads, while inadequate training may prevent workers from meeting expected standards[1023]. The second phase of the risk assessment process concerns risk analysis and is activated once the organisation has identified the various sources of risk and their related effects. During this phase, organisations are required to undertake a structured evaluation, which may also involve the attribution of indicative values in order to estimate both the likelihood of risk occurrence and the severity of its consequences[1024].

The final phase consists in the evaluation of the identified risks, which may be conducted by considering both the probability that harmful events will occur and the seriousness of their potential consequences. In the case of psychosocial risks, however, such analysis requires a more articulated approach, taking into account not only the duration and frequency of exposure, but also the number of workers involved and the ways in which harm may develop or accumulate over time. From this perspective, it could nevertheless be emphasised that a limited number of reports or recorded incidents cannot automatically be interpreted as evidence of a low level of risk. Indeed, the literature demonstrates that psychosocial risks are frequently underestimated and underreported owing to factors such as social stigma, fear of negative repercussions, or uncertainty as to what may genuinely constitute a reportable situation[1025]. For this reason, a reliable assessment should be based upon the integration of heterogeneous sources of information, including organisational indicators, survey data, opportunities for dialogue with workers, and analyses of relevant organisational processes.

This stage is followed by the definition of intervention priorities. While certain risks require immediate action, such as violence and harassment, episodic or persistent work overload, or exposure to traumatic events, other categories of risk call for long-term structural interventions, including the redesign of roles and workflows, the adjustment of performance

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[1023] OIL, "*L'ambiente di lavoro e gli aspetti psicosociali. Sviluppi globali e percorsi per l'azione*", in OIL, 2026, p. 87.

[1024] F.P.F. PONTANI, "*Valutazione del rischio e dell'impatto dei sistemi di IA: regole operative*", *cit.*

[1025] T. MENDUTO, "*Come viene affrontato il rischio stress nelle piccole e medie aziende?*", in PuntoSicuro, 2018; C. NARDELLA, F. D'ORSI, G. GALLI, "*Rest@work reducing stress at work.Toolkit, valutazione e gestione dello stress nelle PMI*", in Manual IT.1.3 .indd, p. 7; T. MENDUTO, "*Stress lavoro correlato: un rischio da gestire insieme*", in PuntoSicuro, 2018.

evaluation systems, the improvement of communication channels, or the strengthening of mechanisms of participation and organisational support[1026]. Within this framework, transparent and participatory decision-making processes involving workers and their representatives become essential in ensuring that the adopted measures are not merely legitimate, but also practically feasible and consistent with the organisation's capacity to sustain change. Such a distinctly participatory perspective becomes even more crucial where employers adopt algorithmic management systems within their organisational structures, since these tools may significantly affect the health and safety of workers performing their duties through technologically mediated systems. Although such technologies may, in certain respects, contribute to reducing work-related stress, improving work organisation, and enabling more efficient staff allocation, they may simultaneously produce detrimental effects by intensifying work rhythms, reducing rest periods, increasing surveillance, and undermining workers' autonomy and decision-making capacity. Within this context, Council Directive 89/391/EEC, previously examined, assumes a pivotal role, insofar as it requires employers to consult workers and their representatives from the very stage of planning and introducing new technologies[1027], as well as to carry out a prior risk assessment before the actual implementation of such technological systems[1028]. This assessment should encompass both physical and psychosocial risks connected, for example, to constant monitoring, productivity pressure, loss of autonomy, and job insecurity deriving from the use of data collected by intelligent systems. Another regulatory instrument that may be invoked in support of this approach is the EU *AI Act*, previously analysed, which requires the identification and analysis of foreseeable risks associated with high-risk AI systems[1029], particularly insofar as they affect work organisation, task allocation, performance evaluation, or the termination of employment relationships[1030]. Information concerning such risks should therefore be shared transparently with workers and their representatives, thereby enabling their effective involvement in the decision-making process. Moreover, particular significance must be

[1026] OIL, "*L'ambiente di lavoro e gli aspetti psicosociali. Sviluppi globali e percorsi per l'azione*", *cit*., p. 88.
[1027] Art. 6, par. 3, lett. c) of the Framework Directive, in Direttiva - 89/391 - EN - EUR-Lex.
[1028] See, in particolar, art. 6, para. 3, lett. a) and art. 9, para. 1, let. A) of the Framework Directive, in Direttiva - 89/391 - EN - EUR-Lex
[1029] Art. 9, par. 2, lett. a) of the *AI Act*, in Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act)Text with EEA relevance.
[1030] Annex III of the *AI Act*, in Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act)Text with EEA relevance.

attributed to the dynamic nature of risk assessment. Artificial intelligence systems may modify their functioning over time through the continuous processing of data, thereby generating new or unforeseeable risks. Consequently, risk assessment cannot be confined to an initial verification phase; rather, pursuant to article 9(2) of the *AI Act*, it should constitute a "continuous and iterative process", subject to constant updating throughout the entire lifecycle of the technological systems adopted. From this perspective, continuous monitoring, periodic review of preventive measures, and the ongoing involvement of workers' representatives become essential elements for ensuring the effective management of emerging risks linked to artificial intelligence and the digitalisation of work[1031].

Having clarified these aspects, the approach offered by the GDPR should not be overlooked when addressing the issue of risk assessment. Within the GDPR framework, risk assessment plays a central role in safeguarding individual rights while specifically focusing on the processing of personal data. The applicability of the protections established by the Regulation is therefore linked to the existence of information directly or indirectly referable to an identified or identifiable individual[1032]. As previously analysed, the logic underpinning the GDPR is based upon the so-called "*risk-based approach*", an approach also shared, albeit differently structured, by the *AI Act*, which assigns the data controller an active and responsible role in the identification, analysis, and management of risks arising from data processing activities. Rather than imposing a rigid and predetermined assessment model, the GDPR requires protective measures to be calibrated according to the specific characteristics of the processing operations, the nature of the data involved, the purposes pursued, and the possible consequences for the rights and freedoms of the data subjects concerned.

Within the employment context, a decision adopted through artificial intelligence systems falls within the scope of the GDPR insofar as it involves the use of information referable to the worker, particularly where such systems perform profiling activities or analyse the employee's personal characteristics; in such circumstances, the automated processing of personal data requires a specific assessment of the risks affecting the rights of the workers concerned. Furthermore, within the GDPR framework, particular relevance is attached to the quality and reliability of the data used by AI systems, since automated decisions based on inaccurate, incomplete, or biased data may negatively affect individuals' rights[1033]; the

[1031] A. CEFALIELLO, J. POPMA, "*How can workers protect themselves against the risks of new technologies?*", in ETUI, 2024, pp. 14-17.
[1032] M. PERUZZI, "*Intelligenza artificiale e lavoro*", *cit*., p. 45 e 65.
[1033] D. MESSINA, "*Dati personali e intelligenza artificiale, quel "vuoto" normativo che ne mina l'affidabilità*", in Agenda Digitale, 2019.

accuracy of data processing therefore represents an essential element also for the prevention of risks arising from the use of artificial intelligence.

With regard to the responsible subjects, the GDPR identifies the data controller, who, within the employment relationship, generally coincides with the employer, as the party responsible for carrying out the assessment and management of risks[1034]. It is therefore incumbent upon the employer to verify the impact of data processing on workers' rights and to adopt all measures necessary to prevent detrimental effects arising from the use of algorithmic or automated systems[1035].

A further normative contribution concerning risk assessment is provided by the Directive on platform work, particularly article 10(1), which establishes, in essence, an obligation incumbent upon digital platforms to monitor the impact of decisions adopted through automated monitoring and decision-making systems on the working conditions of persons performing work through the platform[1036]; such evaluation, which must be conducted every two years, are to be communicated to workers' representatives or, in their absence, directly to the workers themselves[1037]. This framework is reinforced by article 12, which specifically requires an assessment of the occupational, psychosocial, and ergonomic risks that automated monitoring and decision-making systems may pose to workers' health and safety[1038]. Similarly to the evaluation provided for under article 10, this process also entails the involvement of workers' representatives or, where absent, the workers themselves[1039].

Finally, given that the Directive requires not only risk assessment but also the implementation of adequate preventive and protective measures, it can be emphasised that, within a highly technological labour landscape such as that analysed throughout this work, technological tools are radically transforming the methods through which risks are assessed and managed. "*Indeed, sensors, wearable devices, exoskeletons, smart personal protective equipment, and digital monitoring systems now enable the collection of more precise and continuous data*

[1034] In such circumstances, a point of convergence between the two regulatory frameworks may be identified in article 26(9) of the AI Act, whereby the deployer may rely on the information provided by the provider in order to comply with the obligation incumbent upon it to carry out the impact assessment required under article 35 of the GDPR.

[1035] T. TREU, "*CRSD, direttiva sui lavoratori delle piattaforme e valutazione dei rischi*", in Federalismi, 2024, pp. 6-7.

[1036] Art. 10, para. 1, of the Platform Work Directive (2024/2831), in https://eur-lex.europa.eu/legal-content/IT/TXT/PDF/?uri=OJ:L_202402831.

[1037] Art. 10, para. 1 of the Platform Work Directive (2024/2831), in https://eur-lex.europa.eu/legal-content/IT/TXT/PDF/?uri=OJ:L_202402831; T. TREU, "*CRSD, direttiva sui lavoratori delle piattaforme e valutazione dei rischi*", *cit*., p. 16.

[1038] Art. 12, para. 1, lett. a), of the Platform Work Directive (2024/2831), in https://eur-lex.europa.eu/legal-content/IT/TXT/PDF/?uri=OJ:L_202402831.

[1039] Art. 13 and art. 14 of the Platform Work Directive (2024/2831), in https://eur-lex.europa.eu/legal-content/IT/TXT/PDF/?uri=OJ:L_202402831

than traditional methods, thereby allowing dangerous situations to be identified promptly and workers' exposure to risks to be analysed in a more systematic and predictive manner. Such technologies strengthen organisations' capacity to carry out a more dynamic, data-driven risk assessment. Through personalised feedback provided to workers and aggregated information supplied to safety managers, intelligent technologies make it possible to identify critical areas, monitor hazardous working conditions, and intervene rapidly, including in emergency situations such as those involving isolated workers monitored through so-called "man-down" systems. Furthermore, the use of drones or automated systems may reduce human exposure to particularly dangerous activities by transferring certain high-risk operations to machines. However, the digitalisation of safety also introduces new categories of risk that must be incorporated into assessment processes. Exoskeletons, for instance, while reducing certain physical efforts, may generate new biomechanical strains and contribute to the onset of musculoskeletal disorders. Likewise, the effectiveness of sensors may be compromised in environments characterised by dust, heat, fires, or metallic structures, thereby affecting the reliability of monitoring systems. Risk assessment must also consider the consequences arising from the extensive use of data collected through intelligent systems. Digital technologies, in fact, allow the monitoring of workers' vital signs, behaviours, and performance, creating the risk that such information may be used not only for preventive purposes, but also for productivity control or employment-related decisions. In such circumstances, tools originally designed to enhance occupational safety may ultimately become sources of psychological pressure, stress, and perceptions of constant surveillance. Consequently, risk assessment within the digitalised workplace can no longer be confined to traditional physical hazards alone, but must also encompass the new technological, organisational, and psychosocial risks generated by the interaction between workers, algorithms, and intelligent systems" [1040].

5. ***Towards human-centered Artificial Intelligence in platform work: insights from ethics and regulation.***

5.1. Preliminary observations.

[1040] Derived from I. GONZALEZ VAZQEZ et al., "*Digitalisation and workers wellbeing: The impact of digital technologies on work-related psychosocial risks*", JRC Working Papers Series on Labour, Education and Technology 2024/03, in European Agency for Safety and Health at Work, 2024, p. 12.

Against the backdrop of the foregoing analysis, it becomes evident that artificial intelligence systems, particularly those designed to manage the employment relationships of individuals operating through digital platforms, require design, implementation, and management characterized by reliability, transparency, and comprehensibility, in accordance with the principles discussed in the preceding sections. Such measures are essential to ensure the effective safeguarding of fundamental values, including worker participation, consultation, and equitable access to information.

It is crucial that control over these systems remains firmly in human hands, and that they function as tools of support rather than as substitutes for workers. This can be achieved through social dialogue, targeted worker training, and proactive involvement in the system lifecycle, thereby increasing awareness among all stakeholders, developers, employers, and workers, of the potential negative impacts, particularly concerning occupational health and safety.

Furthermore, the establishment of a robust ethical framework is indispensable to guide the development and use of these systems, while simultaneously ensuring compliance with existing regulations.

5.2. Artificial Intelligence and occupational health and safety: human-centred and sustainable algorithmic design.

Furthermore, based on the issues arising from the deployment of AI systems and the regulatory frameworks previously analyzed, several practical recommendations can be formulated, aimed at ensuring both better risk prevention and the responsible utilization of such systems in the context of occupational health and safety.

A first recommendation is to adopt a human-centred approach in the design and implementation of these systems. On the one hand, AI systems must be developed to ensure safety, transparency, and human oversight; on the other hand, effective cooperation between workers, employers, researchers, developers, social partners, industry, and public institutions is essential.

A second recommendation concerns the calibration of risk assessment for these systems. Given their innovative nature, such assessments must be holistic, encompassing all organizational factors, and carried out in collaboration with specialists in algorithmic programming. Furthermore, to maximize effectiveness, these assessments should be periodic, reflecting the evolving nature of AI systems, and grounded in standardized technical

procedures based on scientific evidence. A comprehensive approach should also incorporate multiple levels, including individual roles, organizational structures, sector-specific considerations, regional, and national contexts.

A third recommendation focuses on fostering awareness and knowledge sharing regarding these systems. In this regard, the importance of information and training for workers and their union representatives is emphasized, as well as for employers, *HR* departments, supervisory authorities, and developers.

Training should not only be technical but also raise awareness of the implications for OHS, potential changes to roles and tasks, and the broader organizational impact.

This process requires close involvement of unions, confederations, and system developers, alongside providing workers with access to support mechanisms to address questions or concerns arising from AI system use.

A fourth recommendation stresses the development of a robust ethical framework at both European and international levels, aimed at more effectively regulating the deployment of AI systems in the workplace. However, since ethical principles alone are insufficient, it is crucial to ensure the concrete and effective enforcement of all applicable regulations, including health and safety legislation, national and supranational AI-related laws, such as the *GDPR*, the *AI Act*, and the *Platform Work Directive*.

A fifth recommendation emphasizes the need for interdisciplinary and global research on AI systems and health and safety. Such research could consider aspects like transparency, ethical design, proportionate data collection, and the rights of workers to exercise oversight and challenge decisions made by these systems.

A sixth recommendation emphasizes the strengthening of the so-called *human-in-command* approach in AI research; this approach could focus on verifying the concrete support that AI systems can provide to workers, who must remain, it could be recalled, the central focus of the entire process, while avoiding or at least minimizing risks to occupational health and safety. This is particularly relevant given that, although current regulations have led to significant progress, they are often inadequately enforced, especially by companies operating the platforms themselves[1041].

A seventh recommendation concerns the integration of AI systems into corporate management frameworks; this allows organizations to assess the actual suitability of existing

[1041] V. DE STEFANO, "*The EU Proposed Regulation on AI: A threat to labour protection?*", in Global Workplace Law & Policy, 2021; A. PONCE DEL CASTILLO, "*The AI Regulation: Entering an AI regulatory winter? Why an ad hoc directive on AI in employment is required*", in ETUI Research Paper - Policy Brief, 2021.

management models for handling health and safety risks, which may arise due to organizational changes prompted by the deployment of AI systems.
In cases where corporate management models and AI systems are incompatible, it becomes necessary to develop frameworks that ensure greater safety and sustainability.
An eighth recommendation focuses on promoting knowledge sharing among researchers and developers of these systems. Given that AI relies on programming and the use of big data, it is crucial to foster the exchange of information among developers, the scientific community, and other stakeholders; such collaboration enables more precise research, as well as the design of preventive tools and mechanisms for effective risk assessment, policy-making, and regulatory compliance[1042].

5.3. Regulatory challenges and flexible policy responses for workers' representation in the age of AI.

In support of these recommendations, which are non-binding measures aimed at providing guidance on the interpretation or content of legal rights, certain policy indications may prove extremely useful, as they are designed to reinforce aspects already addressed in the aforementioned recommendations.
A first indication concerns the strengthening of worker representation structures, granting them access to the algorithms in use as well as bargaining power over these systems, given the risks that may arise from their deployment, particularly those related to worker surveillance and performance evaluation.
A second indication, closely related to the first, addresses the intensification of work and the resulting increase in stress due to invasive monitoring and data collection; it emphasizes concrete access for worker representatives to algorithmic systems and the data they employ, in order to prevent such risks.
Clearly, this objective can be more effectively pursued when workers and their representatives are involved from the outset, that is, from the early stages of adoption and implementation of these systems.
A third indication pertains, on the one hand, to the ability of institutions to provide workers and their representatives with rights to information and consultation regarding the deployment of AI systems; on the other hand, given the inadequacy of such capacity, it stresses the

[1042] EU-OSHA, "*Artificial intelligence for worker management: implications for occupational safety and health*", in Eu-Osha, 2022, pp. 24-26.

importance of equipping these stakeholders with adequate technical competencies to monitor system use and participate more actively and consciously in negotiations.
Lastly, a fourth indication considers the opacity, dynamism, and diverse applications of these systems, recommending the adoption of more flexible regulatory approaches, where collective bargaining should play a prominent role.
In this context, the evolution of laws governing worker representation and participation emerges as essential, since, at present, the scope of collective bargaining in this sector remains somewhat limited[1043].

6. ***Towards a universal Charter of Rights for platform workers: minimum protections, safety and human dignity in the global economy.***

Following the line of international regulations on the issues discussed thus far, as well as considering the limited effectiveness of collective bargaining, given that economic operators such as digital platforms have, in many cases, managed to evade their responsibilities regarding the work performed by workers, it becomes necessary, in order to ensure a definitive set of effective and concrete protections for workers, to outline a universal framework of fundamental rights, including aspects related to occupational safety and health. The aim is to guarantee compliance with minimum international standards, centered on the concept of "*decent work*"[1044], and applicable regardless of the worker's location, who, as is now well-known, performs work in a fully globalized market.
This possibility has, to some extent, already been addressed in the context of the Platform Work Directive, through the introduction, within the domestic legal systems of Member States, of a "Statute" of rights for individuals performing work via digital platforms**.**
This applies both to platforms operating within national territories and to workers residing therein, and is based on a system of essential minimum protections, calibrated to the specific characteristics of this form of work.
Furthermore, the same Directive, in Recital 14, emphasizes that workers performing platform-based work "*should be granted minimum rights (...) even in cross-border situations*". A significant document in this context is the *Declaration on the Manipulative Capacity of*

[1043] EU-OSHA, "*Worker participation and representation: the impact on risk prevention of AI worker management systems*", *cit*., p. 26.
[1044] In this regard, M. BIASI, "*Brevissime note sul decent work e sul (diritto del) lavoro in trasformazione*", in LDE, 2025, n. 1, p. 3, tends to highlight that this term expresses a "*policy imperative capable of guiding and shaping regulation in the social sphere*".

Algorithmic Processes, adopted by the Committee of Ministers on February 13, 2019, which seeks to address the risks posed by the use of algorithmic processes designed to manipulate social and political behavior. In this declaration, concerns are raised that individuals, due to the use of advanced digital technologies, particularly micro-targeting, may face limitations in forming independent opinions, making autonomous decisions free from automated systems, and may be manipulated in their economic choices or social and political behaviors.

In this Declaration, the Committee of Ministers urged the 47 Member States to consider "*the need for additional data protection frameworks beyond existing notions of personal data protection and privacy, addressing the significant impacts of targeted data use on societies and on the broader exercise of human rights*"[1045].

The Statute referenced above, in addition to ratifying the protections already established at a universal level by the Directive, such as privacy, protection against discrimination, transparency in algorithmic management, and data portability, also addresses accountability and the monitoring of the cognitive work supply chain, recognizing, in this regard, obligations of *due diligence* and potential joint liability with the client.

It further provides for minimum remuneration, thus avoiding the application of piece-rate payment systems; ensures the effective right to disconnect, which is vital to safeguarding work-life balance and, consequently, the worker's psychophysical well-being[1046]; establishes essential social security protections, through the creation of dedicated institutions and mutual funds; and guarantees concrete occupational safety and health protections, for example, through prior specialized training and possible virtual inspections of remote workspaces.

In cases where digital platforms operate in countries outside the European Union, or when the worker is not resident within the EU, it becomes necessary to turn to the international context[1047], as emphasized by the *International Labour Organization* (ILO).

In one of its *World Reports*, the ILO advocated for the design of an international governance system tasked with defining a set of minimum rights and protections for platform workers, as

[1045] Decl(13/02/2019)1, *Declaration by the Committee of Ministers on the manipulative capabilities of algorithmic processes* (Adopted by the Committee of Ministers on 13 February 2019 at the 1337th meeting of the Ministers' Deputies), in CoE Search, 2019.

[1046] A. PRETEROTI, "*Ambiente digitale e benessere: la disconnessione come diritto della personalità e strumento di tutela della dignità umana*", in RGA, 2023, n. 3, pp. 13 ss.

[1047] A. ALOISI, V. DE STEFANO, "*Il tuo capo è un algoritmo. Contro il lavoro disumano*", Laterza, Roma, Bari, 2020, p. 158, where the development of "*Universal Labour Guarantee*", is encouraged.

well as strict regulation of data usage and accountability for algorithmic systems, requiring full compliance by platforms and their clients, particularly where the latter are enterprises[1048].

Consequently, the establishment of an *International Statute* that directly and effectively applies the principles of *decent work*, which, as is well-known, can be extended to all types of employment relationships, appears feasible[1049]. This approach has been partially realized, albeit within the realm of *soft law*, through a specific *ILO World Report* on digital platforms, which highlighted the need for greater platform accountability, accompanied by guarantees of protections that, under the umbrella of decent work, apply concretely to all platform workers, regardless of their legal classification[1050].

On this basis, and in line with the *Core Labour Standards*, certain areas of intervention can be envisaged that are relevant, to some extent, also for occupational safety and health, and could form the foundation of the Statute. One such area could concern wage guarantees, implementing provisions of the 1949 Protection of *Wages Convention*, including freedom in wage disposition, prohibition of payment in a non-legal currency, and the regularity and timeliness of payments upon the termination of employment contracts.

These guarantees, although basic, can nonetheless help mitigate instances of negligence on the part of digital platforms, while counteracting abusive practices, such as payment through vouchers, which are, for example, widespread in the *crowdwork* context.

Supporting these protections is also the 1998 *ILO Declaration on Fundamental Principles and Rights at Work*, which enumerates, among other core principles and rights, freedom of association and the recognition of the right to collective bargaining, the elimination of all forms of forced labor, the eradication of discriminatory practices in employment, and, importantly, the provision of a safe and healthy working environment[1051].

A second area concerns access to data, privacy, and transparency regarding the terms and conditions of employment contracts, through the application of protections already established by the 1997 *Private Employment Agencies Convention*, which ensures that workers have access to their personal data processed by automated systems, as well as by the

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[1048] ILO Report "*Work for a brighter future Report*", 2019; P. DE PETRIS, "*Il ruolo e le sfide dell'ILO a cent'anni dal Trattato di Versailles: tra moderne innovazioni e vecchie esigenze di protezione*", in DLM, 2020, n. 3, pp. 917 ss.

[1049] See V. FERRANTE (a cura di), "*A tutela della prosperità di tutti. L'Italia e l'Organizzazione internazionale del Lavoro a un secolo dalla sua istituzione*", Giuffré, Milano, 2020.

[1050] OIL, "*Prospettive occupazionali e sociali nel mondo. Il ruolo delle piattaforme di lavoro digitali nella trasformazione del mondo del lavoro*", in OIL, 2021, pp. 220 ss.

[1051] OIL, "*Dichiarazione dell'OIL sui principi e diritti fondamentali del lavoro e i suoi seguiti*", in OIL, 2023, p. 10.

2011 *Domestic Workers Convention*, which guarantees the right to adequate, verifiable, and intelligible information concerning employment terms and conditions.

As noted previously, the protection of rights such as privacy, transparency, and clear information in the context of automated employment management is of such importance that it should extend beyond traditional employment. Indeed, these protections should apply to all forms of work, with the aim of ensuring *decent work* universally.

This is particularly relevant for work performed via digital platforms, where significant information asymmetries often exist to the worker's disadvantage; workers frequently lack, for instance, reliable knowledge about the trustworthiness of the client.

At the international level, the European Union appears to have responded effectively to this challenge. In particular, Directive 2019/1152, which, as noted in Recital 6, seeks to ensure that all EU workers enjoy an adequate level of transparency and predictability regarding their working conditions, establishes the right of workers to receive information about their contractual conditions. Furthermore, it allows workers to anticipate potential modifications to these conditions, which, in an era characterized by rapid digitalization, evolve at a relentless pace, thereby enabling workers to maintain a dynamic understanding of their employment terms[1052].

Secondly, the Directive on improving working conditions in platform work, cited in the preceding chapters, establishes, in article 9, which emphasizes the need for transparency in the operations of digital platforms, the obligation for platforms to provide workers and their representatives with information (in a written document, using clear and accessible language) regarding the functioning of automated monitoring or decision-making systems. This includes, in particular, the categories of data and actions monitored, the purpose of such monitoring, its intended recipients, the fact that these systems have been implemented, the types of decisions made, the data or parameters used, and the categories of decisions taken by these systems that may, in some way, affect individuals performing work via digital platforms[1053].

Further reinforcement of this right derives from the recent Proposal for a Directive on the use of algorithmic management in the workplace[1054], introduced primarily to address gaps in the

[1052] A. RIVARA, "*La Direttiva sull'informazione e l'effettività dei diritti"*, in DLRI, 1999, pp. 133 ss.

[1053] *Directive (EU) 2024/2831 of the European Parliament and of the Council* of 23 October 2024 on improving working conditions in platform work, art. 9, available at Eur-lex.

[1054] It refers to the Proposal for a Directive of the European Parliament and of the Council on algorithmic management in the workplace**,** annexed to the European Parliament's Motion for a Resolution containing recommendations to the Commission on digitalisation, artificial intelligence and algorithmic management in the workplace (shaping the future of work)**,** available at European Parliament, 2025/2080. (INL).

previous Directive. Article 3 (para. 1) establishes that "*Member States shall ensure that employers and service commissioners provide, respectively, to their employees and to self-employed individuals with whom they have a contract, as well as their representatives, written information on the actual or intended use of algorithmic management systems in the workplace*".

According to the regulation, this information must be provided promptly and in a clear and intelligible manner. Paragraph 2 specifies that such information should include a statement regarding the actual or intended use of these systems, including a description of their objectives, the categories of data collected and processed concerning the aforementioned workers (e.g., data on behavior and performance), and an indication that the collected data is used to execute automated decision-making processes, accompanied by a description of the nature and significance of these decisions. Clearly, the right to information must extend not only to workers but also, as repeatedly emphasized, to their representatives.

In this regard, article 4 (para. 2) of the Proposal provides that consultation (conducted in accordance with article 4 (para. 1)(c) of Directive 2002/14/EC) should cover the aims pursued through the deployment and updating of such systems, the work processes and workers involved, as well as changes affecting workload, intensity, scheduling, working hours, task flexibility, and occupational safety and health. It also includes information on the types of data collected, all measures implemented to identify and mitigate risks of bias or discriminatory outcomes, mechanisms of human oversight, and training and support measures for both employees and individual self-employed workers.

A third area concerns the possibility of equitable termination of the employment relationship, as enshrined in the *Termination of Employment Convention* No. 158 of 1982, which represents a cornerstone principle and is particularly applicable to contracts concluded with digital platforms. These platforms often exploit power asymmetries, terminating work relationships arbitrarily and without notice, for instance by deactivating the accounts through which workers access tasks[1055].

A fourth area concerns labor mobility[1056], as recognized in the *Employment Policy Convention* of 1964, which emphasizes that employment must be freely chosen. From this, it could be inferred that digital platforms should not restrict workers (e.g., crowdworkers) from collaborating with other platforms, nor prevent them from leaving one platform for another, or from providing services directly to clients independently of any platform.

[1055] T. RAHIMIAN, "*When algorithms fire Humans*", in OnLabor, 2022.
[1056] F. BANO, "*Mobilità virtuale su piattaforme digitali*", in LDE, 2022, 3, pp. 519 ss.

To strengthen such a guarantee, it is necessary to establish efficient transnational communication mechanisms between platforms (as also provided for in article 9 (para. 6) of the Platform Work Directive), enabling workers to transfer their ratings, the number of tasks completed, and other relevant information from one platform to another; this facilitates easier access to work opportunities and social security, reflecting the interconnected nature of data portability and labor mobility within the platform work context.

A fifth area relates to dispute resolution. Although no ILO Convention specifically addresses this issue, such mechanisms are fundamental to safeguarding the principles of decent work. In this regard, it would be desirable to apply the provisions of ILO Recommendation No. 130 of 1967 on the examination of complaints, ensuring that workers have the opportunity to challenge reputational rankings, client reviews, and algorithmic evaluations applied by platforms[1057].

A sixth area pertains to the right to non-discrimination, given the sometimes ambiguous effects of automated systems. On the one hand, these systems may facilitate more rational and objective decisions, being free from typical human errors and biases[1058].

On the other hand, if an algorithm incorporates a biased input or parameter[1059], it may propagate prejudice[1060] throughout the decision-making process, generating systemic discrimination and complicating the victim's ability to seek redress due to the often opaque nature of algorithmic bias[1061].

From a regulatory perspective, this right is first reflected in article 35 (para. 7)(b) *GDPR*, which requires, among other elements, an assessment of the necessity and proportionality of data processing in relation to the intended purposes.

Secondly, the *AI Act* mandates that IA system providers adopt data governance measures to evaluate potential biases that could result in discrimination and maintain technical documentation demonstrating possible discriminatory impacts and the risk of bias in relation to the systems' aims. This is also linked, to some extent, to explainability obligations regarding the effects of such systems.

[1057] P. DE PETRIS, "*Lavoro e piattaforme digitali. Qualificazione, poteri e tutele*", Giappichelli, Torino, 2025, pp. 361-365.

[1058] G. GAUDIO, "*Le discriminazioni algoritmiche*", in LDE, 2024, n. 1, p. 23.

[1059] S. CRISCI, "*Intelligenza artificiale ed etica dell'algoritmo*", in Foro Amministrativo, 2018, n. 10, pp. 1787 ss.

[1060] A. KELLY-LYTH, "*Algorithmic discrimination at work*", in ELLJ, 2023, vol. 14, n. 2, pp. 152 ss.

[1061] M. BARBERA, A. GUARISO (a cura di), "*La tutela antidiscriminatoria. Fonti, strumenti, interpreti*", Giappichelli, Torino, 2019.

Furthermore, employers who deem that the use of such systems may pose risks to fundamental rights are required, pursuant to articles 26 (para. 5) and 79 (para. 1), to suspend their operation.

Similarly, the *Platform Work Directive* establishes, in article 10 (para. 3), that if human oversight reveals a high risk of discrimination in the employment relationship, the digital platform must implement all necessary measures, including modifications to the automated decision-making and monitoring system or the cessation of its use, to prevent the recurrence of such discriminatory decisions in the future.

This provision, further clarified by Recital 49, which requires platforms to promptly rectify discriminatory automated decisions, or, where this is not feasible, to take all necessary measures, including discontinuing their use, reinforces, even in the algorithmic context, the right to non-discrimination. This right serves to limit employer power, aligning with the labor framework that seeks to harmonize "*the values of productive efficiency, inherent in the organizational authority of the employer, with the intrinsic values of the human person*"[1062].

Ultimately, this right has been enshrined in a *Draft Convention on Decent Work* in the *Platform Economy*, based on conclusions adopted during the *International Labour Conference* following the first discussion of the topic in its 113th session[1063].

Article 3 of this *Draft Convention* obliges Member States to adopt all necessary measures to guarantee platform workers fundamental labor rights, including the elimination of any form of discrimination in employment. In accordance with article 16, it requires measures to prevent both direct and indirect discrimination when automated systems are used, covering aspects such as remuneration and access to work. Moreover, under article 20, it prohibits the suspension, deactivation, or termination of accounts or employment relationships for discriminatory or unjustified reasons[1064].

A seventh and final area concerns occupational health and safety .

The European Parliament, in its Resolution proposing recommendations to the Commission on digitalization, artificial intelligence, and algorithmic management in the workplace, emphasizes that the increasingly pervasive use of digital technologies in the workplace, including platforms that ensure constant connectivity, real-time monitoring, and surveillance, poses serious risks to workers' health and safety.

[1062] L. MENGONI, "*Diritto e valori*", il Mulino, Bologna, 1985, p. 398.

[1063] ILO, "*Outcome of the Standard-Setting Committee on Decent Work in the Platform Economy*", ILC.113/Record No. 6A.

[1064] ILO, "*Decent work in the platform economy"*, International Labour conference, 114th Session, 2026", in ILO, 2025, pp. 12-36.

These technologies increasingly blur the boundaries between professional and private life, contributing to excessive work-related stress, burnout, social isolation, and, in the context of algorithmic management, intensified performance pressure, which can result in musculoskeletal and cardiovascular disorders, fatigue, and an increased likelihood of ignoring safety warnings, thereby heightening workplace hazards.

The Resolution highlights the need for a comprehensive assessment of such risks, which should include continuous monitoring and the implementation or significant modification of new AI tools or algorithmic management systems. It calls for effective cooperation among Member States and social partners to develop specific guidelines for the responsible deployment of AI in the workplace, sharing best practices in the process.

Moreover, strong emphasis is repeatedly placed on the fundamental role of social dialogue and the active involvement of workers and their representatives in the deployment of AI tools and algorithmic management technologies, particularly in platform work.

From this, it is clear that both worker participation in decision-making processes and the provision of information and training can significantly enhance workers' understanding of how these technologies operate, as well as their ability to interact safely with them, fostering a sense of autonomy and trust.

Equally, the need for clear assignment of responsibility within the employer's organizational structure is highlighted, to ensure effective human oversight; this allows workers to identify a human point of contact for guidance in case of doubts or concerns, thereby reducing the stress and anxiety often associated with the opacity of algorithmic management.

These principles are reflected in the aforementioned Proposal for a Directive.

Article 7 requires Member States, without prejudice to the provisions of Directive 89/391/EEC and other OSH-related directives, to ensure that employers conduct a proper and thorough risk assessment related to algorithmic management systems.

This assessment must cover workplace accidents, ergonomic and psychosocial risks, as well as significant pressures exerted on workers. Employers are also required to evaluate the adequacy of safeguards within these systems in relation to the specific characteristics of each work environment and to implement the most effective prevention and protection measures possible.

Lastly, the Draft Convention mentioned earlier also emphasizes this approach.

After stating in article 3 that Member States must adopt all measures necessary to ensure platform workers enjoy fundamental labor rights, including the right to a healthy and safe work environment (article 3 (para. 1)(e)), article 4 (para. 1) obliges Member States to require

digital labor platforms, to the extent reasonably practicable, to implement appropriate measures aimed at preventing workplace injuries, occupational diseases, and any other health harms arising from the performance of work.

This must be accompanied by a thorough assessment of all occupational risks and the implementation of effective prevention and control measures.

These measures, as clarified in paragraph 2, must focus on preventing workplace accidents, occupational diseases, and any other health hazards associated with long working hours and often insufficient rest periods.

Article 5 further stipulates that each Member State must require digital labor platforms to ensure that platform workers receive information and training on *Occupational Safety and Health*, as well as any equipment used in the performance of work that, as far as reasonably practicable, does not pose risks to health and safety. Moreover, these workers must, where reasonably practicable, have access to appropriate clothing and personal protective equipment aimed at preventing workplace accidents, occupational diseases, and any other harm that could compromise health.

Additionally, article 6(a) establishes the right of these workers to refrain from performing any work that may pose a serious and imminent risk to their life or health, without fear of retaliation, provided that the digital labor platforms are promptly informed (article 6(b)).

It should be noted, however, that under article 7, Member States must adopt measures to ensure that workers comply with prescribed health and safety measures, take care of their own safety and that of others, and cooperate with digital labor platforms in fulfilling their health and safety obligations.

The issue of health and safety also encompasses two further areas.

The first concerns the impact of automated systems, which, under article 16 (para. 1)(b), must not adversely affect the health and safety of workers.

The second relates to the protection of personal data and privacy for digital platform workers, with article 19 (para. 1)(d) prohibiting the collection, storage, processing, and use of personal data relating to physical and mental health or other sensitive information, except where necessary to prevent a serious and imminent threat to life or health, or as required by national laws and regulations, international labor standards, or other relevant international instruments[1065].

[1065] ILO, "*Decent work in the platform economy*", *cit.*, pp. 33-36.

Ultimately, the *Draft Recommendation on Decent Work in the Platform Economy*, adopted by the International *Labour Conference during its 114th session on XX June 2026*, provides that Member States, regarding health and safety, should encourage digital labor platforms to grant workers access to sanitation facilities and drinking water in relation to their work. Furthermore, according to paragraph 16, workers must have the right, depending on the specific circumstances and nature of the work performed, to refuse an assignment or even disconnect from the platform to protect their mental health, without fear of retaliation[1066].

7. ***Concluding reflections.***

In light of the reflections developed thus far, there emerges a compelling need for a profound rethinking of the techniques and instruments required to ensure occupational health and safety within the unprecedented and complex context of digital transformation and artificial intelligence.

Throughout this study, it has been observed that the increasingly pervasive diffusion of automated systems employed by digital platforms in the context of employment relations, far from constituting a mere opportunity for efficiency and innovation, in fact gives rise to new and multifaceted challenges for the protection of workers' physical and psychological integrity. In this scenario, the centrality of the human person must constitute the cornerstone of a regulatory model aimed at reconciling technological progress with ethics, innovation with dignity, and efficiency with sustainability.

Occupational health and safety, within this framework, assumes a pivotal and cross-cutting role. It could no longer be conceived merely as a technical compliance requirement, but rather as a guiding principle permeating the entire life cycle of artificial intelligence systems, from their design to their implementation and management, underpinned by a dynamic assessment of risk grounded in the principles of prevention, participation, transparency, and shared responsibility.

This necessarily implies a strengthening of employers' obligations in matters of algorithmic transparency, continuous monitoring of the effects produced by automated systems, and the provision of ongoing training for workers, training that must be calibrated to the complexity and mutability inherent in the digital environment.

[1066] ILO, "*Decent work in the platform economy*", *cit*., pp. 38-40.

Such an objective can only be fully achieved through a multi-level and cooperative approach, founded, on the one hand, on the adoption of international technical standards and on inclusive forms of governance involving employers, employees, trade unions, and public institutions; and, on the other hand, on the enhancement of collective bargaining as a personalised instrument of protection capable of adapting to the specific features of platform work and the digital economy.

However, the full realisation of these safeguards presupposes a renewed role for trade unions and mechanisms of worker representation, which, at present, are too often excluded from algorithmic decision-making processes.

In this regard, it becomes indispensable to ensure that workers' representatives have effective access to data and algorithms, as well as to promote continuous education pathways, in order to construct a prevention system that is truly inclusive, equitable, and effective.

At the international level, the action of organisations such as the *International Labour Organization* (ILO) acquires particular significance. The ILO has repeatedly emphasised the necessity of establishing a set of universal and non-derogable standards in matters of occupational health and safety and workers' rights, applicable regardless of legal status or geographical location.

Within this framework, the notion of a **"***Universal Charter of Rights of Platform Workers*", inspired by the principle of *decent work*, has emerged, a proposal designed to bridge existing regulatory gaps and ensure genuine global equity.

The ILO, therefore, through its instruments, has delineated a legal framework aimed at ensuring contractual transparency, freedom of occupational choice, non-discrimination, and the protection of digital workers' health and safety.

Such a perspective has already been partially embraced, at EU level, by the *Directive on Platform Work*, which, *inter alia*, provides for minimum rights even in cross-border situations (as stated in Recital 14) and introduces a core set of guarantees concerning algorithmic transparency, employer accountability, the right to disconnect, and the protection of workers' health and safety.

Alongside this, instruments such as Directive (EU) 2019/1152**,** the *Proposed Directive on Algorithmic Management in the Workplace*, the *GDPR* (article 35 (para. 7)), and the *AI Act*, impose specific obligations regarding data governance, risk assessment, and the prevention of discrimination generated by automated systems.

Within this broader context, occupational health and safety transcends the confines of technical regulation to embody the tangible expression of the fundamental right to human

dignity in work, as well as a cornerstone of ethically oriented technological development. It must therefore stand at the centre of every public and corporate policy concerning digital transition, so that digitalisation does not result in a regression of labour protections but rather represents an opportunity for their evolution and reinforcement, in the spirit of inclusiveness and sustainability.

Ultimately, only an integrated, participatory, and multi-level approach, capable of harmonising European, international, and national frameworks, can ensure a virtuous balance between technological innovation and the protection of the human person. Work, far from being reduced to a mere means of subsistence, must remain the cornerstone of human fulfilment, the foundation of dignity, and the vehicle of self-realisation in the digital age. And it is precisely on this basis that occupational health and safety can be upheld as a universal and inalienable principle, the very fulcrum of every policy of responsible technological development, so that the digital revolution may not herald the dawn of a new dominion of machines over humankind, but rather the full affirmation of the rights of the working person as the rights of the human person *tout court***.**

The digital transformation of work and the progressive diffusion of artificial intelligence systems require a profound rethinking of the traditional categories underpinning occupational health and safety protection. In particular, algorithm-driven organisational models challenge the classical paradigm of risk assessment, historically based on the assumption of relatively stable, observable, and ex ante identifiable hazards. By contrast, algorithmic systems are characterised by intrinsic dynamism: they learn, evolve, and continuously reorganise their operational logic on the basis of processed data. As a result, risk can no longer be conceived as a static or episodic phenomenon, but must instead be understood as a permanent, adaptive, and participatory process, capable of capturing emerging, cumulative, and often unforeseeable forms of vulnerability. Within this context, an additional critical issue arises, namely the growing overlap between occupational safety tools and digital surveillance practices. Technologies initially introduced to prevent risks and enhance workers' well-being may progressively extend their function beyond preventive purposes, becoming instruments of behavioural monitoring and productivity control. This may risk normalising pervasive forms of surveillance, with evident implications for workers' autonomy, privacy, and psychological integrity. At the same time, a structural paradox of the digitalisation of safety emerges: intelligent technologies, although designed to reduce occupational risks, often end up redistributing and transforming them rather than eliminating them. Exoskeletons, for instance, may reduce certain physical loads while simultaneously generating new biomechanical

stresses; algorithmic planning systems may optimise work organisation but intensify work rhythms; and continuous monitoring tools, although intended for prevention, may foster stress, anxiety, and job insecurity. In this perspective, digitalisation does not eliminate risk but rather transforms its nature, progressively shifting it from the physical sphere to the psychosocial and organisational dimension.

Despite the increasing density of European regulatory interventions in the fields of artificial intelligence, data protection, platform work, and occupational health and safety, the current legal framework still appears highly fragmented. These instruments, in fact, often operate in parallel and only partially coordinated ways, thereby generating uncertainty regarding the allocation of responsibilities, the scope of risk assessment obligations, and the effectiveness of preventive and control mechanisms. This fragmentation highlights the need for a more coherent systemic coordination of the relevant disciplines, capable of addressing the transversal nature of digital risks.

In this scenario, the role of worker participation acquires a profoundly renewed significance. It can no longer be reduced to a merely consultative or informational mechanism, but must evolve towards genuinely participatory forms through which workers and their representatives can effectively influence the design, implementation, monitoring, and revision of automated systems. Only in this way can risk assessment become truly dynamic, preventive, and socially legitimate.

Ultimately, the challenge posed by artificial intelligence does not primarily concern the potential replacement of human labour, but rather the ability of legal systems to govern technological power in line with the centrality of the working person.

The future of work should depend not so much on the sophistication of algorithms, but on the capacity of regulatory and institutional systems to ensure that technological innovation remains firmly subordinated to the principles of dignity, equality, and human development.

In this perspective, occupational health and safety remains not only a technical safeguard, but a concrete and indispensable expression of the protection of the working person in the age of the digital revolution.

CONCLUSIONS

The analysis conducted throughout this research has demonstrated how the digital revolution and the advent of artificial intelligence are effecting a profound and paradigmatic shift in the field of labour law, which is now called upon to engage with a novel technological rationality capable of permeating production, organisational, and decision-making processes.

In particular, cognitive automation, algorithmic management, and the proliferation of work via digital platforms have transformed the very structure of enterprises, reshaping the relationships between power, responsibility, and the dignity of the working individual.

From the outset of the first chapter, it became evident that digitalisation, far from representing a mere technical evolution, constitutes a structural and anthropological phenomenon capable of altering not only the very nature of work but also the human experience of productive activity. Artificial intelligence, in its multiple manifestations, from robotics to ambient intelligence, from big data to predictive profiling, represents today a transversal force, capable both of enhancing operational capacities and of generating new vulnerabilities, particularly in terms of health, safety, and psychosocial well-being.

Within this context, the fundamental challenge lies in reconciling innovation with protection, progress with responsibility, and technology with rights.

The second chapter highlighted the guiding role assumed by European Union law in the regulation of artificial intelligence applied to employment relationships.

In this regard, Regulation (EU) 2024/1689 (also referred to as the *AI Act*), the *Directive on Work via Digital Platforms* 2024/2831, and Regulation (EU) 2016/679 on the protection of personal data constitute the three pillars of a new regulatory architecture founded upon transparency, human oversight, and the so-called *risk-based approach*, considered a cornerstone for the prevention of health and safety risks.

Specifically, the *GDPR* has recognised fundamental rights for digital platform workers concerning the processing of personal data, including the right to be informed, to access, rectify, or erase personal data, to limit its use, and to object to automated decisions that produce significant effects on their work activities. These safeguards aim to rebalance the power dynamic between platforms and workers, countering the growing opacity of algorithmic processes.

The *AI Act* has introduced a preventive framework for the assessment and management of risks associated with high-risk AI systems, while the *Platform Work Directive* has reaffirmed

the centrality of human intervention, establishing the principle that technological tools, including automated systems in platform work, cannot be used to circumvent the protection of fundamental worker rights.

The EU's attention to digital health and safety has signalled a departure from traditional conceptions of prevention, extending protective measures to psychosocial and relational risks arising from human–machine interaction.

The third chapter, dedicated to a comparative analysis of the experiences of Italy, Spain, and the United Kingdom regarding the legal classification of work performed via digital platforms, revealed the full complexity underlying national solutions and the diversity of responses that these three countries have attempted to provide.

In the Italian context, given the hardness of classifying this type of work relationship strictly within the notions of subordination or autonomy, the legislator has pursued an intermediate approach, designating these workers as "hetero-organised" under article 2 of Legislative Decree No. 81/2015 (as amended by Decree-Law 101/2019, converted into Law 128/2019).

Consequently, although formally autonomous, such workers are entitled to the protections typically afforded to employees, including those relating to health and safety under Legislative Decree No. 81/2008. This approach aligns with the considerable influence exercised by companies managing digital platforms over the execution of work, which effectively deprives workers of the freedom that autonomy would ordinarily guarantee.

Moreover, the legislator has extended a minimum set of protections to so-called autonomous riders under article 47-*bis* of the aforementioned decree, requiring that platform operators ensure, pursuant to Article 47-septies, paragraph 3, of Legislative Decree 81/2015, the health and safety protections provided under Legislative Decree 81/2008.

Case law practice, moreover, following numerous appeals aimed at securing effective protections for these workers in light of the sometimes evasive stance of platform operators regarding the application of statutory safeguards, has increasingly recognised the legal classification of subordination under article 2094 of the Civil Code. This trend is evident in a series of rulings, from the well-known *Foodora* cases to decisions by the Court of Palermo in 2020, the Courts and Courts of Appeal in Turin between 2021 and 2022, and the Courts of Milan in 2022 and 2023, acknowledging the growing subjection of workers to the three traditional employer powers (directive, supervisory, and disciplinary).

In Spain, the matter has primarily been addressed through a series of judicial rulings, beginning with the *Juzgado de lo Social in Barcelona and Valencia* in 2018, and culminating in the *Supreme Court* decision of 2020. These rulings, in recognising the existence of

subordination, emphasised the absence of autonomous organisation on the part of workers and their submission to the unilateral organisation imposed by the platform, which exercises managerial powers of direction, organisation, and control over them. These factors are interpreted as indicators of dependency in line with the concept of subordination under article 1.1 of the *Estatuto de los Trabajadores*.

Building on this judicial reasoning, the legislature, through the *Ley Rider* (Law 12/2021), intervened more decisively than in the Italian system, introducing a presumption of subordination for platform workers. The purpose of this measure, as examined in the course of the analysis, was to incorporate within the realm of subordination, and thus under the protective scope of the Workers' Statute, all manifestations of algorithmic power, since platform operators exercise employer powers more intensively via algorithmic tools. Clearly, this has implications for health and safety, invoking the application of article 4 of the Workers' Statute and Law No. 31/1995 on the prevention of occupational risks, under which employees benefit from extensive protections, while independent contractors remain largely excluded, except in specific cases involving shared workplaces or the use of company equipment. Such distinctions underscore the need for a clearer recognition of riders' rights to ensure effective safety and prevention.

In the United Kingdom, by contrast, despite the absence of specific legislation, case law has established an intermediate category between employee and independent contractor: the so-called worker, entitled to essential rights such as the national minimum wage, paid leave, and health and safety protection. From the landmark decision in *Ready Mixed Concrete* (1967) to *Autoclenz Ltd v Belcher* (2011), the courts have prioritised the substantive nature of the work relationship over its formal contractual terms. This approach was subsequently affirmed in the landmark case *Uber v Aslam* (2021), where the Supreme Court recognised the status of drivers as workers, placing the protection of the worker at the centre of legal consideration.

A further step was taken in *IWGB v Secretary of State for Work and Pensions* (2020), which extended health and safety protections to workers, in alignment with European directives on occupational health and safety (beginning with the so-called "*Framework Directive*" 89/391/EEC) and article 31 of the *Charter of Fundamental Rights of the European Union*.

In the fourth chapter, reflections were undertaken regarding the organisational transformation engendered by algorithmic management, illustrating how artificial intelligence, far from merely optimising production processes, effectively assumes the role of an organisational agent. Algorithms allocate tasks, evaluate performance, monitor behaviour, and influence career decisions. However, such functions carry significant side effects for health and safety,

giving rise to unprecedented forms of stress, alienation, isolation, and anxiety linked to constant evaluation, as well as the risk of discriminatory outcomes.

Within this context, a profound rethinking of the concept of a "*safe working environment*" is required, which can no longer be confined to the physical dimension but must encompass digital wellbeing, understood as the balance between innovation, autonomy, and dignity.

The fifth chapter, after outlining the health and safety prevention systems in each of the three countries, highlighted the urgency of a coordinated and comparative regulation of algorithmic transparency and emerging risk prevention. The analysis of the three legal systems reveals a gradual convergence towards the promotion of trade union participation, information provision, and prior consultation as key instruments for the sustainable management of automation.

This chapter examines the regulation of transparency and the protection of health and safety for digital platform workers through a comparative lens of Italian, Spanish, and British legislation, aiming to understand how different legal systems address the challenges posed by algorithmic management in the labour market, particularly within the gig economy.

The discussion begins with a reflection on the regulatory challenges arising from the use of artificial intelligence in workforce management. In particular, Directive 2019/1152 and the Directive on Digital Platform Work 2024/2831 represent the first attempts to regulate this sector, emphasising transparency, predictability, and protections for workers. However, the effectiveness of these instruments depends on how they are implemented within national legal frameworks.

In the Italian system, occupational health and safety legislation (Legislative Decree No. 81/2008) remains primarily oriented towards protection in "physical workplaces", whereas Directive 89/391/EEC emphasises protection "during" the course of work.

This shift highlights the necessity of updating the concept of safeguarding in an increasingly dematerialised labour environment. Article 2087 of the Civil Code, while more flexible, often conflicts with regulations linking protections to physical contexts, creating grey areas for digital workers. The text thus addresses occupational safety in the digital era, moving from a traditional preventive approach to a more functional and technologically attuned perspective.

The *gig economy* has facilitated the use of automated systems to manage and monitor work, with significant implications for transparency and workers' rights. Algorithmic systems often operate as "black boxes," making it difficult to understand the criteria behind decisions directly affecting working conditions, thereby raising the issue of algorithmic explainability,

already enshrined in data protection legislation (Directive 95/46/EC and *GDPR*), which obliges employers to provide information on the functioning of such systems.

In the Spanish system, legislation distinguishes between self-employed and subordinate workers, seeking to extend certain protections to the former, particularly when work is performed on-demand via apps. Nevertheless, regulatory gaps persist, requiring adjustments to ensure more effective protection for gig economy workers. In general, Spanish health and safety legislation clearly differentiates between employees and self-employed workers: under Royal Legislative Decree 2/2015 (Workers' Statute) and Law 20/2007 (Statute for the Self-Employed), employees receive "effective" protection, while self-employed workers are afforded "adequate" protection. Where platform workers are classified as employees, Law 31/1995 on the Prevention of Occupational Risks applies fully, imposing stringent obligations on employers; where they are deemed autonomous, the regulatory framework offers less protection, potentially creating gaps in safety coverage.

In the United Kingdom, the legal system combines *duty-based* and *outcome-based* obligations, with particular attention to the management of psychosocial risks associated with the use of algorithmic tools. The principle of "*reasonable practicability*" grants employers flexibility in implementing safety measures, raising questions about the actual level of worker protection. Under Section 2 of the *Health and Safety at Work Act* (HSWA), employers are required to ensure employee safety "*so far as is reasonably practicable*", balancing the level of risk against the cost of preventive measures in terms of money, time, and effort.

The chapter concludes with a comparative analysis of the three countries, highlighting the importance of transparency and trade union consultation in algorithmic management. In Italy, a regulatory pathway has been established to enhance transparency in algorithmic use and strengthen the role of trade unions. Notably, two recent legislative decrees, Legislative Decrees No. 81/2015 and No. 104/2022, introduced specific provisions for platform workers, aiming to ensure clearer rights and protections. The former, through article 47-*ter*, obliges platform operators to provide information regarding health and safety protections, as further specified in article 47-*septies*; the latter, through the introduction of article 1-*bis* in Legislative Decree No. 152/1997, requires companies to provide transparent information on the use of automated personnel management systems, engaging trade unions in decision-making processes. Trade unions, for their part, play a crucial role in monitoring compliance, ensuring that algorithmic management does not result in discriminatory or harmful practices.

In Spain, an advanced approach has been adopted for regulating the gig economy and algorithmic labour management through the enactment of the so-called "*Ley Rider*" in 2021;

this legislation recognises the subordinate status of *riders* and imposes a high level of transparency regarding the algorithms used to manage work.

A key element is the mandatory involvement of trade union representation: article 18 of Law 31/1995 requires employers to provide detailed information on health and safety risks, including those arising from the use of digital systems for task allocation and monitoring.

Furthermore, article 20-*bis* of the Workers' Statute safeguards workers' privacy regarding the use of digital devices, an increasingly pertinent issue in the context of automated surveillance.

Although the combination of transparency, union consultation, and data protection renders the Spanish legal framework one of the most advanced in Europe, significant challenges remain concerning the actual enforcement of these rules by digital platforms, which, as is also observed in the Italian system, sometimes classify workers as self-employed rather than employees.

In contrast to Italy and Spain, the United Kingdom has adopted a more flexible approach based, as previously noted, on the principle of "*reasonable practicability*" in the context of occupational safety and the regulation of digital work. *The Health and Safety at Work etc. Act* 1974 obliges employers to ensure safe working conditions to the extent reasonably practicable, without imposing stringent requirements regarding algorithmic transparency or trade union consultation. Moreover, the *Information and Consultation of Employees Regulations 2004* (ICER), which govern worker involvement in business decisions, do not include specific obligations concerning algorithmic management, resulting in lower levels of protection compared with Italy and Spain, particularly in terms of transparency and information.

However, the debate on AI regulation has recently led to the proposal of the *Artificial Intelligence (Regulation and Employment Rights) Bill* 2024, which introduces new provisions on algorithmic management, including trade union consultation where automated decisions may pose significant risks to workers. Compared with the Italian and Spanish models, the British system remains less prescriptive, granting employers greater discretion in the use of algorithmic tools.

The comparative analysis of the three countries reveals notable differences. While the Italian and Spanish legal systems have developed more regulated frameworks, ensuring greater transparency in algorithmic management and an active role for trade unions, the United Kingdom tends to maintain a more flexible approach, with fewer constraints on businesses and a worker protection regime still in development.

Nonetheless, the shared objective across the three systems is to ensure that AI systems operate in a manner that is explainable, traceable, and verifiable, preserving human oversight and, above all, safeguarding workers' physical and psychological integrity.

The regulations reviewed, despite their diversity, collectively contribute to constructing a European mosaic of digital prevention, founded on a modern conception of shared employer responsibility, encompassing the risks arising from automated decision-making.

A recurring theme emerging from this analysis is the pivotal role of trade union consultation as a mechanism to balance the power of digital platforms and ensure equitable management of work.

A transparent and regulated algorithmic system not only protects workers but also fosters a more sustainable and responsible business model.

Ultimately, the sixth chapter broadens the perspective to the international level, highlighting the contribution of multilateral organisations (ILO, UN, OECD) and technical standards (ISO/IEC) in promoting a global culture of safety in the digital era.

While the increasing integration of digital technologies into work has undoubtedly delivered significant benefits, such as enhanced productivity, innovation, and the creation of new employment models, it has also introduced substantial health and safety risks, particularly in digitally managed platform work. In this context, traditional health and safety regulations, including those of the three jurisdictions analysed, though comprehensive in many respects, require targeted updates to address emerging technological risks effectively.

To meet these challenges, legislative reforms, the adoption of voluntary standards, continuous training, awareness campaigns, evidence-based research, and, above all, the active involvement of social partners emerge as essential instruments for safeguarding the well-being of workers in the digital age.

At the international level, the ILO has played a pivotal role in promoting safe working environments, even amidst technological evolution. In particular, Conventions such as No. 155 and No. 187 provide adaptable frameworks, ensuring that legal systems remain aligned with the advancements brought about by new technologies. These Conventions establish fundamental rights and duties, as workers must have the ability to refuse unsafe situations, thereby obliging employers to guarantee the safety of AI systems and digital tools.

Other key instruments include Convention No. 161 on Occupational Health Services, Recommendation No. 194 on Occupational Diseases, and Convention No. 190, which addresses violence and harassment, including those of a digital nature.

In line with these principles, recent initiatives have been developed, such as the ILO's "*OSH Strategy 2024–2030*", the "*AI and Work Observatory*", and measures aimed at strengthening tripartite social dialogue, all of which pave the way for a fair and safe digital transition.

Beyond the ILO, global actions such as the *G7 Italy 2024 Action Plan for Human-Centred AI* and webinars by the International Ergonomics Association have demonstrated particular attention to the impact of AI tools. Equally, the work of standardisation bodies, such as ISO, seeks to develop safety standards for industrial robotics, although gaps remain, particularly concerning exoskeletons.

A key factor in this transition is the active participation of workers, who have the right to continuous training and involvement in the selection, implementation, and assessment of new technologies. Social dialogue, founded on trust and transparency, fosters both innovation and risk prevention.

Employers are also required to adopt modern occupational health and safety management systems, in accordance with the *ILO-OSH 2001 guidelines*, which include clear safety policies, defined responsibilities, structured risk assessments, regular audits, and continuous improvement. Technological, physical, and psychosocial risks demand participatory and up-to-date evaluations, hierarchical application of controls, eliminating hazards whenever possible, and the use of engineering or administrative measures, with *personal protective equipment* (PPE) as a last resort.

In practice, this encompasses robotics, VR simulations, smart wearable devices, and AI-based monitoring. Furthermore, the integration of AI into safety systems presents new opportunities for real-time hazard detection and predictive analysis. Crucially, such tools must support rather than replace human judgment: ethical and readily interpretable AI should constitute a cornerstone of the future of work.

In conclusion, managing the digital transformation of work requires a balanced, proactive, and inclusive approach that protects workers, respects human dignity, and ensures that technology serves people rather than the reverse.

The integration of *AI Risk Assessment* and *AI Impact Assessment*, together with the principles of human-centred design, allows for the development of an advanced prevention model grounded in participation, dynamic risk evaluation, and ethical accountability.

Within this framework, the proposal of a *Universal Charter of Rights for platform workers* emerges as a long-term vision, serving as an instrument to guarantee minimum and uniform protections globally, based on safety, dignity, and freedom from technological discrimination.

From the synthesis of this analysis, several conclusive reflections can be drawn.

First, the regulation of digital work requires a new legal paradigm capable of transcending the dichotomy between innovation and protection, through an integrated approach that combines labour law, technology law, and human rights law.

Secondly, health and safety, far from being regarded as mere formal compliance, must be recognised as a substantive right to the quality of work, encompassing its psycho-physical, relational, and digital dimensions.

Thirdly, the algorithmic management of work, given its capacity to redefine employer authority, must be structured around principles of transparency, traceability, and collective accountability, whereby the worker is no longer a passive object of technology but an active participant in its design, oversight, and improvement.

Ultimately, the challenge posed by artificial intelligence in the world of work is not merely technological but profoundly ethical and social, as it compels the law to rediscover its original function: the protection of the individual in their integrity and dignity, particularly, and above all, against the new, often invisible, forms of power generated by algorithmic tools.

The human-centred vision of AI, proposed as the guiding thread of this thesis, is therefore not a utopia but a necessity, as it offers an effective means to ensure that technological innovation remains at the service of humanity, and not the reverse.

It is precisely through such an approach that it will be possible to secure a future of work not dominated by machines, but as a realm in which human dignity remains the ultimate measure of progress.

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