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AI, Working Machinery and OSH Implications: Human Rights Approach and Liability Regimes in the Multilevel Regulation

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1. *Introduction*

The evaluation of workers' rights as human rights is the subject of a wide-ranging and controversial debate[1], which starts from the possible advantages of this key to the full realisation of social protections in the path of

[1] The debate is broad and controversial and straddles labour law and international law. For an international labour framework, ALSTON, (ed.), *Labour Rights as Human Rights*, Oxford University Press, 2005; LEARY, *The Paradox of Workers' Rights as Human Rights*, in COMPA, DIAMOND (eds.), *Human Rights, Labor Rights and International Trade*, University of Pennsylvania Press, 1996; COLLINS, *The Role of Human Rights in Labour Law*, in COLLINS (ed.), *Putting Human Rights to Work*, Oxford University Press, 2022; BELLACE, TER HAAR, *Perspectives on labour and human rights*, in BELLACE, TER HAAR (eds.), *Research Handbook on Labour, Business and Human Rights Law*, Edwar Elgar Publishing, 2019; FINKIN, *Worker rights as human rights: regenerative reconception or rhetorical refuge?*, in BELLACE, TER HAAR (eds.), *Research Handbook on Labour, Business*, cit., pp. 102-129; COLLINS, MANTOVALOU, *Human Rights and the Contract of Employment*, in COLLINS, MANTOVALOU (eds.), *The Contract of Employment*, Oxford University Press, 2016. For a general overview of the debate in the Italian literature, please refer to the reflections carried out by PERULLI in the introductory paper of the *10th Seminar on International and comparative labour law, Labour Rights as Human Rights*, held at the Cà Foscari University of Venice from 3 to 6 June 2024; as well as PERULLI, BRINO (eds), *A Global Labour Law: Towards a New International Framework for Rights and Justice*, Giappichelli, 2024.

sustainability[2]. Equally debated is the identification of the regulatory techniques – hard or soft, private or public, unilateral or negotiated – that operatively must accompany this transition; even more so is the evaluation of the consequences on the remedial level of this binomial in the global workplace[3].

The need for this approach to labour protection, driven by national, international and European doctrine, can be observed from two distinct perspectives. That of the Global North[4], where the need emerges for regulatory techniques capable of satisfying new demands for protection beyond typological qualification[5]. That of the Global South where the full affirmation of

[2] Fasciglione, *Impresa e diritti umani nel diritto internazionale. Teoria e prassi*, Giappichelli, 2024; Ales, *Tracing the Social Sustainability Discourse within EU Law: the Success of the "Labour-Rights-as-Human-Rights" Approach*, in this journal, 2024, 1, p. 30; Sanguineti Raymond, *La Diligencia Debida en Materia de Derechos Humanos Laborales*, in this journal, 2024, I, pp. 165-217; Guarriello, *Take Due Diligence Seriously: comment alla direttiva 2024/1760*, in *DLRI*, 2024, 3, pp. 245-298; Valenti, *Riflessioni in tema di sostenibilità sociale nel diritto del lavoro tra tecniche di tutela e prove di* regulatory compliance, in this journal, 2024, 3, p. 469 ff.; Ponte, *Catene di valore, diritti dei lavoratori e diritti umani: riflessioni intorno alla proposta di direttiva relativa al dovere di diligenza delle imprese ai fini della sostenibilità*, in *AD.it*, 2024, 1, p. 1 ff.; Borzaga, Mussi, *Luci e ombre della recente proposta di direttiva relativa al dovere di due diligence delle imprese in materia di sostenibilità*, in *LD*, 2023, 3, pp. 495-514; Giovannone, *Dovere di diligenza e responsabilità civile nella proposta di direttiva europea*, in this journal, 2023, 3, pp. 469-500; Giovannone, *The European directive on "corporate sustainability due diligence": the potential for social dialogue, workers' information and participation rights*, in *ILLEJ*, 2024, 1, pp. 227-244; Mocella, C*atene globali del valore e tutela dei diritti umani*, in *DRI*, 2025, 1, pp. 26-44; Sanguineti, *Il nuovo diritto transnazinoale del lavoro nelle catene globali del valore: caratteristiche e modello regolatorio*, in *DRI*, 2025, 1, pp. 2-25.

[3] Brino, *Hard and Soft Law Instruments for regulating Multinational Enterprises: an Unphill Struggle towards Global Responsibility?*, in Ales, Basenghi, Bromwich, Senatori (eds), *Employment Relations and Transformation of the Enterprise in the Global Economy*, Giappichelli, 2016, pp. 85-108; Brino, *Corporate sustainability due diligence: quali implicazioni per i diritti dei lavoratori?*, in *Dir. um. dir. int*, 2023, 17, 3, pp. 707-729; Ferrante, *Diritti dei lavoratori e sviluppo sostenibile*, in *JUS*, 2022, 3, pp. 349-369. On the weakness of soft law sources, Pertile, *La crisi del sistema di supervisione dell'Oil nel suo contesto: il timore è fondato, ma agitarsi non serve a nulla*, in *LD*, 2019, 3, pp. 407-428; Corazza, *Verso un nuovo diritto internazionale del lavoro?*, in *DLRI*, 163, 3, pp. 487-498.

[4] The distinction between Global North and Global South is widely used within national and international legal literature. For a general framing of its implications from the perspective of labour law and international law, Buchanan et al. (edited by), *The Oxford book of International Law and Development*, Oxford University Press, 2023; Tyc, *Global trade, labour rights and international law - a multilevel approach*, Routledge, 2021.

[5] On the subject in the national legal system see Perulli, *Oltre la subordinazione. La nuova tendenza espansiva del diritto del lavoro*, Giappichelli, 2021; Perulli, Treu, *"In tutte le sue forme e applicazioni": per un nuovo Statuto del lavoro*, Giappichelli, 2022; Zoppoli, *Prospettiva rimediale, fat-*

social rights, in the sphere of human rights, is still in progress, aggravated moreover by dumping phenomena in global supply chains[6].

These evolutionary dynamics are also reflected in the European institutions in promoting the unstoppable rise of human rights as a countervalue of the global market and, above all, of the global digital market[7] and artificial intelligence. Notoriously, the AI market is less governed by European countries in terms of production (also due to a greater shortage of raw materials in which the Global South is rich) and know-how (which other areas of the Global North such as the USA and China are more equipped with). Precisely for this area, it is increasingly being overseen by the European institutions in terms of legal regulation. This is by virtue of a more deep-rooted protective attitude, not only of its social legislation obviously aimed at protecting the person, but of the "product discipline" itself whose primary focus remains the protection of competition in the single market today, however, in a more ethical and anthropocentric sense.

In this regard, emblematic is EU Regulation No. 2024/1689 (AI Act)[8] on the use of artificial intelligence systems which, among the most important profiles, addresses that of the implications that the use of AI can have on the health and safety of workers – as well as users in general – also for the purpose of identifying the responsibilities of deployers (including employers, manufacturers, designers, installers) and the users themselves. There is no

tispecie e sistema nel diritto del lavoro, Editoriale Scientifica, 2022; TREU, *Rimedi, tutele e fattispecie: riflessioni a partire dai lavori della Gig economy*, in *LD*, 3-4, 2017; CIUCCIOVINO, *La crisi della fattispecie e l'approccio rimediale nella discussione giuslavoristica*, in this journal, 1, 2024, pp. 5-22; PERULLI, *Cittadinanza, subordinazione e lavoro nel diritto del lavoro che cambia*, in *LD*, 1, 2024, pp. 44-63; TULLINI, *Cittadinanza sociale, nuovi diritti, universalismo delle tutele*, in *LD*, 1, 2024, pp. 65-76; RAZZOLINI, *Effettività e diritto del lavoro nel dialogo fra ordinamento dell'Unione e ordinamento interno*, in *LD*, 1, 2024, pp. 447-467; TYC, *Global trade, labour rights and international law – a multilevel approach*, cit.

[6] BORELLI, ORLANDINI, *Lo sfruttamento dei lavoratori nelle catene di appalto*, in *DLRI*, 173, 2022, 1, pp. 109-133; GUARRIELLO, NOGLER, *Violazioni extraterritoriali dei diritti umani sul lavoro: un itinerario di ricerca tra rimedi nazionali e contrattazione collettiva transnazionale*, in *DLRI*, 166, 2020, 2, pp. 173-185.

[7] TREU, *CSRD, direttiva sui lavoratori delle piattaforme e valutazione dei rischi*, in *Federalismi*, paper 18 December 2024; TER HAAR, *Industry 4.0 + Industry 5.0 = Happy Marriage Between Humans and Technology*, in *ILLEJ*, 2024, 17, 2, pp. 189-213.

[8] Reg. 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence and amending reg. No 300/2008, No 167/2013, No 168/2013, 2018/858, 2018/1139 and 2019/2144 and dir. 2014/90/EU, 2016/797 and 2020/1828 (OJEU 12.7.2024).

doubt, in fact, that the protection of safety at work can be ascribed to the area of workers' fundamental and human rights at national, European and international level, also due to its status of core-labour standard. Thus, through prevention protection, the historical link between the social regulation of working conditions and that of the conditions of use of products – to which both EU Regulation No. 2024/1689 and EU Regulation No. 2023/1230 (Machinery Regulation)[9] on the requirements of work equipment also for the purposes of health and safety at work belong – is increasingly strengthened, while respecting the different legal basis of reference.

Starting from these premises, the essay focuses first of all on the anthropocentric evolution that European regulatory techniques are having in the context of product discipline, both that of the AI Act and the Machines Regulation, through a specific declination of the conceptual dichotomy labour rights as human rights.

The first aim is to illustrate how the two acts fit into the European project of shaping a cultural model of digital economy based on the protection of European social values and fundamental (and human) rights in the competitive global scenario. The AI Act raises questions about the adequacy of national rules governing many areas of employment, including health and safety. Also, the European act interacts with technical harmonisation legislation on requirements for machinery and work equipment, now regulated by the Machinery Regulation (§2).

Furthermore, reading the two acts together provides new insights into the alignment between workers' rights and human rights, responding to the weakening of traditional labour law. This last point is particularly clear with reference to the AI Act which, together with other legislative developments on due diligence, pushes companies to take into account the risks of human rights violations without undermining the centrality of shareholder value (§3).

The Machinery Regulation is fully relevant to this discussion, because it will apply to systems that use artificial intelligence technologies. In this regard, it should be noted that the commercial regulations governing work equipment, which currently straddle the two regulations, aim to establish a very strict guarantee for manufacturers without neglecting the responsibil-

[9] Reg. 2023/1230 of the European Parliament and of the Council of 14 June 2023 on machinery and repealing Dir. 2006/42/EC of the European Parliament and of the Council and Council dir. 73/361/EEC (OJEU L 165/1 29.6.2023).

ities of other external actors downstream of the product's placing on the market (§4).

Therefore, the essay shows how, rather than rolling back existing protections, this new legislative framework introduces a product regulation technique in which the relative risks are assessed taking into account the vulnerability of individuals (and workers) and their degree of exposure to human rights violations, including the right to health and safety at work. At national level, this new conceptual basis and the resulting regulatory technique that incorporates risk management (and directs it towards the protection of human rights of workers) prompts an investigation into the compatibility of the aforementioned regulatory framework with the parameters developed by case law in implementation of Italian legislation on occupational health and safety for assessing the liability of employers and workers themselves, if AI and automatized machines are used in the direction or execution of the work performance. In addition, the responsibility of those involved throughout the "supply chain" (designers, manufacturers and suppliers) will be assessed (§5). Possible evolutionary interpretations are proposed in the conclusions (§6).

2. *Positioning the AI Act in the OSH discipline*

Regulation (EU) 2024/1689 (AI Act) subjects the entire discipline of the employment relationship to a stress-test, requiring interpreters to question the adequacy of national rules governing multiple regulatory areas[10].

[10] Ciucciovino, *Risorse umane, intelligenza artificiale e Regolamento (UE) 2024/1689*, in *DRI*, 3, 2024, pp. 573-614; Ciucciovino, *La disciplina nazionale sulla utilizzazione della intelligenza artificiale nel rapporto di lavoro*, in *LDE*, 2024, 1, pp. 18-19; Viscomi, *Professionalità e diligenza ai tempi della transizione digitale*, in *LLI*, 2024, 10, 1, pp. 53-70; Zoppoli, *Il Diritto del lavoro dopo l'avvento dell'IA: aggiornamento o stravolgimento? Qualche utile appunto*, in this journal, 3, 2024, pp. 409-430; Brino, *La tutela della persona che lavora nell'era dell'IA tra sfide etiche e giuridiche*, in this journal, 2024, 3, p. 431; Carinci, Ingrao, *L'impatto dell'AI Act sul diritto del lavoro*, in *DLRI*, 2024, 184, 4, pp. 451-494; Mantelero, Peruzzi, *L'AI e la gestione del rischio nel sistema integrato delle fonti*, in *RGL*, 2024, 4, pp. 517-537; Faioli, *Assessing Risks and Liabilities of AI-Powered Robots in the Workplace. An EU-US Comparison*, in *DSL*, 2025, 1, pp. 79-113; Zappalà, *Dalla digitalizzazione della pubblica amministrazione all'amministrazione per algoritmi: luci e ombre dell'effetto disruptive sui rapporti di lavoro*, in *Federalismi.it*, 2024, 27, pp. 232-265; Zappalà, *Informatizzazione dei processi decisionali e diritto del lavoro: algoritmi, poteri datoriali e responsabilità del prestatore nell'era dell'intelligenza artificiale*, in *WP C.S.D.L.E. "Massimo D'Antona"*, 2021, 446; Novella, *Poteri del datore di*

Naturally, there is no shortage of reflections on the impact of the new European regulations on health and safety at work, due to the adaptation of the domestic legal system to the traditional framework of protections, obligations and related responsibilities of the actors of the prevention system[11].

In the field of occupational health and safety, in fact, it should be noted that IA systems can represent a tool for exercising employer powers and prerogatives, a tool for performing work and, even more specifically, an individual or collective (so-called smart) protective device[12]. In each of these

lavoro nell'impresa digitale: fenomenologia e limiti, in *LD*, 2021, 3-4, pp. 451-470; VOZA, *Lavoro autonomo e capitalismo delle piattaforme*, Cedam, 2018; PERUZZI, *Intelligenza artificiale e lavoro. Uno studio su poteri datoriali e tecniche di tutela*, Giappichelli, 2023; GARGIULO, *Intelligenza Artificiale e poteri datoriali: limiti normativi e ruolo dell'autonomia collettiva*, in *Federalismi.it*, 2023, 29, pp. 171-191; FAIOLI, *Unità produttiva digitale. Perché riformare lo Statuto dei lavoratori*, in *EL*, 2021, 1, p. 48; BIASI (a cura di), *Intelligenza artificiale e diritto del lavoro*, Giuffrè, 2024; TEBANO, *Lavoro, potere direttivo e trasformazioni organizzative*, Editoriale Scientifica, 2020; ZAMPINI, *Intelligenza artificiale e decisione datoriale algoritmica. Problemi e prospettive*, in *ADL*, 2022, 3, p. 481 ff.; FALERI, *Management algoritmico e asimmetrie informative di ultima generazione*, in Federalismi.it, 2024, 3, p. 217; J. PRASSL, *What If Your Boss Was an Algorithm? Economic Incentives, Legal Challenges, and the Rise of Artificial Intelligence at Work*, in *CLLPJ*, 2019, 41, 1, p. 146.

[11] For an overview of the main issues *Revolutionizing health and safety: the role of AI and digitalization at work*, ILO, Geneva, 2025. In literature, TULLINI, *Prevenzione e tutela della sicurezza sul lavoro nell'economia digitale*, in *RDSS*, 2021, 4 p. 671 ff.; PASCUCCI, *Sicurezza sul lavoro e cooperazione del lavoratore*, in *DLRI*, 2021, 3, p. 421; PASCUCCI, *Note sul futuro del lavoro salubre e sicuro… e sulle norme sulla sicurezza di rider & co.*, in *DSL*, 2019, 1, p. 37; PASCUCCI, *Le nuove coordinate del sistema prevenzionistico*, in *DSL*, 2023, 2, p. 37 ff.; TEBANO, *Intelligenza Artificiale e datore di lavoro: scenari e regole*, in this journal, 2024, 3, p. 449 ff.; BARBERA, *"La nave deve navigare". Rischio e responsabilità al tempo dell'impresa digitale*, in *LLI*, 2023, 2, p. 3 ff.; PERUZZI, *Sistemi automatizzati e tutela della salute e sicurezza sul lavoro*, in *DSL*, 2024, 2, p. 86 ff.; SQUEGLIA, *Obiettivi, strumenti e metodi dell'intelligenza artificiale nella tutela della salute e della sicurezza dei lavoratori*, in *DSL*, 2025, 1, pp. 114-133; LAI, *Brevi note in tema di Intelligenza Artificiale e salute e sicurezza del lavoro*, in *LDE*, 1, 2025. Let us also refer to GIOVANNONE, *Responsabilità datoriale e prospettive regolative della sicurezza sul lavoro. Una proposta di ricomposizione*, Giappichelli, 2024, p. 161 ff.

[12] Regarding the impact of the AI Act on OSH regulations, also from the perspective of fundamental rights, CEFALIELLO, KULLMANN, *Offering false security: How the draft artificial intelligence act undermines fundamental workers rights*, in *ELLJ*, 2022, 13(4), pp. 542-562; ALMADA, PETIT, *The EU AI Act: A Medley of Product Safety and Fundamental Rights?*, in *RSC WP*, 2023, 59, European University Institute Robert Schuman Centre for Advanced Studies; JAROTA, *Artificial intelligence in the work process. A reflection on the proposed European Union regulations on artificial intelligence from an occupational health and safety perspective*, in *CLSR*, 2023, 49, pp. 1-14; BOTERO ARCILA, *AI liability in Europe: How does it complement risk regulation and deal with the problem of human oversight?*, in *CLSR*, 2024, 54, pp. 1-17; GREDKA-LIGARSKA, *Employer as an AI System Operator and Tortious Liability for Damage Caused by AI Systems: European and US Perspectives*, in *CJCL*, 2024, 12, pp. 1-23. Multidisciplinary research has examined the impact of AI on health and safety protection

applications, AI can constitute a hypothesis for the evolution of "experience and technique" (art. 2087 of the Civil Code)[13] and for the predisposition of an adequate organisational structure of the enterprise (art. 2086 of the Civil Code)[14], for a better governance of risk, provided that the role of the *human factor* is not excessively minimised or completely eliminated[15].

In turn, the experimentation of these safety management models opens the door to new scenarios for assessing the position of the employer, for the purposes of attributing responsibility for the accident and risk event[16], as well as of the worker himself in relation to his possible culpable complicity. In par-

in the workplace. Cfr. AKYILDIZ, *Integration of digitalization into occupational health and safety and its applicability: a literature review*, in *EuRJ*, 2023, 9, 6, pp. 1509-1519; A. SHAH, MISHRA, *Artificial intelligence in advancing occupational health and safety: an encapsulation of developments*, in *J. Occup. Health*, 2024, 66, 1, pp. 1-12; BUDI MAHENDRA et al., *Restructuring the occupational health and safety management system in the era of artificial intelligence*, in *JPH*, 2025, 47, 1, pp. e168-e169. On the contribution of occupational medicine, EL-HELALY, *Artificial Intelligence and Occupational Health and Safety, Benefits and Drawbacks*, in *Med Lav*, 2024, 115, 2, p. 1 ff. On the contribution of engineering, GIALLANZA et al., *Occupational health and safety issues in human-robot collaboration: State of the art and open challenges*, in *Saf. Sci*., 2024, 169, p. 1 ff.; NGUYEN et al., *Human-Centered Edge AI and Wearable Technology for Workplace Health and Safety in Industry 5.0*, in TRAN (eds), *Artificial Intelligence for Safety and Reliability Engineering. Springer Series in Reliability Engineering*, Springer, 2024, pp. 171-183. In the management area, MELHEM et al., *Integrating Occupational Health and Safety with Human Resource Management: A Comprehensive Approach*, in AWWAD (eds) *The AI Revolution: Driving Business Innovation and Research*, Springer, 2024, pp. 311-317; MOORE, *OSH and the Future of Work: Benefits and Risks of Artificial Intelligence Tools in Workplaces*, in DUFFY (eds) *Digital Human Modeling and Applications in Health, Safety, Ergonomics and Risk Management*, Springer, 2019, pp. 292-315.

[13] Regarding Article 2087 of the Italian Civil Code as an accessory obligation, similar to a collateral provision with respect to the duty of diligence, fairness and good faith, MESITI, *L'ambito di applicazione della tutela prevenzionistica ed antinfortunistica e, segnatamente, dell'art. 2087 c.c.*, in *LG*, 2017, 4, p. 322.

[14] On the subject see FAIOLI, *Adeguatezza ex art. 2086 c.c. e obbligo di introdurre tecnologia avanzata per mitigare i rischi da lavoro*, in *Federalismi.it*, 6, 2025, pp. 143-157.

[15] *Ex multis*, MARASSI, *Intelligenza artificiale e sicurezza sul lavoro*, in BIASI (a cura di), *Diritto del lavoro e intelligenza artificiale*, *op. cit*., p. 207 ff.; DELFINO, *Lavoro e realtà aumentata: i limiti del potenziamento umano*, in BIASI (a cura di), *op. cit*., p. 601 ff.; MAIO, *Diritto del lavoro e potenziamento umano: i dilemmi del lavoratore aumentato*, in *DRI*, 2020, 3, p. 167 ff.; ALOISI, DE STEFANO, *Il tuo capo è un algoritmo*, Laterza, 2020; DAGNINO, *Dalla fisica all'algoritmo: una prospettiva di analisi giuslavoristica*, in *ADAPT University Press*, Modena, 2019.

[16] On the new frontiers of "risk", LOI, *Lavoro, transizione ambientale e digitale nella regolazione procedurale del rischio*, in ALBI (a cura di), *Il diritto del lavoro nell'era delle transizioni*, Pacini Giuridica, 2024, pp. 67-93; LOI, *Il rischio proporzionato nella proposta di regolamento sull'IA e i suoi effetti nel rapporto di lavoro*, in *Federalismi.it*, 2023, 4, pp. 239-259.

ticular, these critical issues arise when the AI system acts as an autonomous manager or executor of the work process, while the residual organisational, managerial, control and spending powers vested in the OSH system's guarantors are not clearly defined. Furthermore, there are cases in which workers suffer physical or psychological harm as a result of using equipment that employs AI systems. In such cases, it is natural to wonder how the liability of the various parties in the supply chain is determined for damage caused by defective products, equipment or machinery, or by incorrect risk assessment, failure to maintain equipment or improper tampering with equipment. However, in these cases, it is necessary to address the need to prevent forms of objective personal liability and, at the same time, clarify the level of autonomy of AI systems and the residual margin of decision-making and execution remaining with natural persons. Thus, on the insurance front (through the National Institute for Insurance against Accidents at Work - INAIL), it may be useful to consider the potential implications of these accident trends on the rule exempting employers from the obligation to pay compensation[17].

It should be made clear that the AI Act cannot answer all these questions because its purpose is to create a single market for AI by ensuring that its devices are safe and respect the fundamental values of the European Union, through a balanced reconciliation of social rights and market protection. For this reason, its legal basis is the protection of competition (Articles 114 and 16 TFEU)[18].

Therefore, the AI Act is part of the complex puzzle of technical harmonisation regulations on the requirements for machinery and equipment (including work equipment), flanking Directive 2006/42/EC[19] (henceforth

[17] It is also true that the re-emergence of the exemption rule under Article 10 of d.P.R. No. 1124/1965 encounters, more generally, insurmountable constitutional limits, which will be discussed below. On the subject, Faioli, *Data Analytics, robot intelligenti e regolazione del lavoro*, in *Federalismi.it*, 2022, 23, pp. 149-165.

[18] Resta, *Governare l'innovazione tecnologica: decisioni algoritmiche, diritti di gitali e principio di uguaglianza*, in *PD*, 2019, 2, pp. 199-236; Alaimo, *Il Regolamento sull'Intelligenza Artificiale: dalla proposta della Commissione al testo approvato dal Parlamento. Ha ancora senso il pensiero pessimistico?*, in *Federalismi.it*, 2023, 25, p. 133 ff.; Peruzzi, *Intelligenza artificiale e lavoro: l'impatto dell'ai act nella ricostruzione del sistema regolativo UE di tutela*, in Biasi (a cura di), *Intelligenza artificiale e diritto del lavoro*, cit., p. 113 ff.; Sartor, *L'intelligenza artificiale e il diritto*, Giappichelli, 2022, p. 45 ff.; Ingrao, *"Glasnost'" versus "Trade Secrets". Sui limiti ai diritti di informazione e di accesso al codice sorgente dell'intelligenza artificiale derivanti dal segreto commerciale*, in *RGL*, 2024, 4, p. 571 ff.

[19] See Annex I, Section A of dir. 2006/42/EC of the European Parliament and of the

Machinery Directive), soon to be repealed by Regulation (EU) No. 2023/1230[20] (henceforth Machinery Regulation) for workers' health and safety profiles. The relationship between these two acts is then destined to interact with the provisions set out to protect the healthiness of the working environment. At national level, these include those of Title I[21] and Title III[22] of Legislative Decree No. 81/2008[23].

The link with the product discipline is not surprising, since the OSH discipline is pervaded by a high technical component that supports the content specification of the safety obligation and, consequently, the perimeter of civil and criminal liability. This emerges from the overall structure of Legislative Decree No. 81/2008, which requires a combined reading of the general provisions of Title I, on the one hand, and those of the special Titles and the numerous technical Annexes, on the other. With reference to work equipment, this technique transpires from the necessary cross-references between the general obligations under Title I and the specific characteristics of work equipment under Title III[24], which are in turn supplemented by the technical standards under Annexes V, VI and VII and the specific sector regulations[25].

With respect to the interaction between the Italian regulations and the AI Act, there is a fear that the AI Act may generate, in practice, antinomies between the two regulatory frameworks and in fact lower the protective

Council of 17 May 2006 on machinery, and amending dir. 95/16/EC (recast) (OJ L 157, 9.6.2006, p. 24).

[20] Reg. 2023/1230 of the European Parliament and of the Council of 14 June 2023 on machinery and repealing Dir. 2006/42/EC of the European Parliament and of the Council and Council Dir. 73/361/EEC.

[21] Titled *Principi comuni (*Common Principles*)*.

[22] Titled *Uso delle attrezzature e dei dispositivi di protezione individuale* (Use of equipment and personal protective equipment*)*.

[23] As supplemented by subsequent sector regulations.

[24] Titled *Uso delle attrezzature e dei dispositivi di protezione individuale* (Use of equipment and personal protective equipment).

[25] Similarly, in legal proceedings relating to accidents caused by the use of defective equipment, technical advice known as "percipiente" (percipient) is particularly important. Cfr. Cass. 27 June 2024. In literature, Proto Pisani, *Lezioni di diritto processuale civile*, Jovene, 1996, p. 477; Luiso, *Diritto processuale civile*, II, *Il processo di cognizione*, Giuffrè, 2000, p. 90; Auletta, *Il procedimento di istruzione probatoria mediante consulente tecnico*, Cedam, 2002; Ricci, *Le prove atipiche tra ricerca della verità e diritto di difesa*, *Atti del XXV Convegno Nazionale dell'Associazione italiana fra gli studiosi del processo civile*, *Cagliari, 7/8 ottobre 2005*, Giuffrè, 2007.

standards on the use of work equipment and the assessment of the related risks. This is especially so in light of the regulatory system of the European act, which focuses on the risk management of so-called "high-risk" systems and on the construction of a system of obligations aimed at making manufacturers or producers (providers) and, at most, suppliers or first-level users (first-level deployers) responsible. Instead, the role of second-level users (second-level deployers or rather users), which undoubtedly include employers, is relegated to the background[26]. In detail, the regulation devotes particular attention to the regulation of risk management, focusing on 'high-risk' systems used in "employment, workers' management and access to self-employment", and in particular for the recruitment or selection of natural persons, for taking decisions on the promotion and termination of employment, as well as for the assignment of tasks, monitoring or assessment of persons in employment-related contractual relationships (Annex I). While such systems are permitted, they impose particularly stringent regulatory burdens in the form of the adoption of "appropriate data governance and management practices". The assessment of compliance with these requirements is entrusted to internal procedures to be carried out by the provider itself (Art. 19)[27]. As for employers using such systems, they must more simply follow instructions and report any serious incidents or malfunctions to the supplier/distributor. Conversely, where the risk to the rights and freedoms of individuals is limited, the regulation essentially imposes transparency obligations. Finally, where the risk is minimal, the use of self-regulation through the adoption of "codes of conduct" is encouraged.

Consequently, the framework for allocating civil liability, particularly that relating to the use of "high-risk" systems (Article 27), referring to producers and suppliers, would be too lenient for the entrepreneur/employer (user) as the primary guarantor of worker's health and safety[28]. In fact, if we pay attention to the obligations dictated by Articles 14, 15, 16 and 17[29], they

[26] On this point, Ciucciovino, *Risorse umane, intelligenza artificiale e Regolamento (UE) 2024/1689*, cit.

[27] Only high-risk AI systems used for biometric identification are covered by conformity assessment by a notified body.

[28] Cairoli, *Intelligenza artificiale e sicurezza sul lavoro: uno sguardo oltre la siepe*, in *DSL*, 2024, 2, p. 26 ff.

[29] In general, with regard to algorithms whose operation is considered high-risk, art. 14 requires that their operation must always be supervised by the user, including through a com-

mainly concern the supplier who must: ensure that the system complies with all requirements and has adequate quality management measures in place; draw up the technical documentation of the system; keep automatically generated logs; ensure that the system is subject to the relevant conformity assessment procedure. In essence, these burdens describe an upstream-oriented responsibility for the use of such technologies, towards the supplier. On the contrary, a residual civil liability for the employer is outlined, relegated to the only hypothesis in which the latter makes "significant changes" to the normal operation of the AI software[30]. However, the same hypotheses of producer and user liability would be linked only to risks that determine a significantly harmful impact on the health and safety of the worker (Art. 27). Therefore, from the point of view of the health and safety of workers, this arrangement would lead to a system that is not very harmonious with respect to that intended by Directive 89/391/EEC and its derived norms[31].

However, it must be pointed out that the AI Act expressly refers to the remaining technical harmonisation legislation and, precisely, the Machinery Directive[32], which will be definitively repealed by the aforementioned Machinery Regulation as of 20 January 2027. Likewise, more generally, it is clear that the AI Act cannot exhaustively fill the vagueness of the OSH obligation arising from the use of such systems. In fact, the regulation has a declaredly circumscribed scope of action[33], mainly focused on risk management in the

puter interface. Furthermore, art. 15 prescribes that such tools, net of human control, must be designed in such a way as to achieve a reasonable level of accuracy and cyber-security. As a closing rule, then, art. 17 prescribes that algorithms must be equipped with their own self-assessment mechanism, regarding the quality of their functioning.

[30] In all other hypotheses, the only party liable under the strict liability regime is precisely the provider, even in the case of the processing of sensitive employee data (art. 15). The employer (user), in fact, is only obliged to comply with the directives and instructions for use drawn up by the provider, to observe compliance with them throughout the application process, to monitor the system and, in the event that he perceives risks to health or fundamental rights, to take corrective measures or discontinue use (art. 29). Art. 29, paragraph 1-bis, then provides for the obligation for the user to implement human supervision of the system, ensuring that the persons responsible for ensuring such supervision are competent, adequately qualified and trained and have the necessary resources to ensure effective supervision of the system.

[31] More specifically, on the impact of the directive at EU and comparative level, see Ales (edited by), *Health and Safety At Work. European and Comparative Perspective*, *Kluwer Law International*, 2013; Ales, *Occupational Health and Safety: a European and Comparative Legal Perspective*, in *WP C.D.S.L.E. "Massimo D'Antona"*, 2015, 12.

[32] Recital 26 and Annex V, Part A.

[33] Mantelero, Peruzzi, *cit.*, p. 518.

commercial sphere and aimed at providing a minimum and complementary level of protection that does not preclude the introduction of more favourable rules for workers, also through collective agreements[34]. Therefore, these obligations must be supplemented with those arising from other European and internal sources already in force.

3. *The AI Act in the EU frame on digital economy*

The AI Act is part of a broader reformist project that attempts to shape a "cultural" model[35] of the digital economy, the backbone of which is the safeguarding of European social values and fundamental rights – even human rights[36] – in the new competitive scenarios of global markets[37], even before the labour market[38].

Within this "anthropocentric" view[39], the complementarity of the data protection regulation (EU) 2016/679 (GDPR)[40], of the Directive (EU)

[34] Art. 2, co. 11.

[35] Finocchiaro, *La regolazione dell'Intelligenza Artificiale*, in *RTDPub*, 2022, 4, p. 1091. See also the reflections of Brino, *La tutela della persona che lavora nell'era dell'IA tra sfide etiche e giuridiche*, in this journal, 2024, 3, p. 431 ff.

[36] De Stefano, Aloisi, *Fundamental labour rights, platform work and human rights protection of non-standard workers*, in Bellace, Blank, ter Haar (edited by), *Research Handbook on Labour, Business and Human Rights Law*, cit., pp. 359-379; De Stefano, *"Negotiating the Algorithm": Automation, Artificial Intelligence, and Labor Protection*, in *CLLPJ*, 2019, 41, 1, pp. 15-46; De Stefano, *The Rise of the "Just-in-Time Workforce": On-Demand Work, Crowdwork, and Labor Protection in the "Gig-Economy"*, in *CLLPJ*, 2016, 37, pp. 471-504; De Stefano, Aloisi, *European Legal framework for digital labour platforms*, European Commission, Luxembourg, 2018, p. 11.

[37] Bellavista, Santucci, *Tecnologie digitali, poteri datoriali e diritti dei lavoratori*, Giappichelli, 2022; Bassan, *Corso di diritto internazionale dell'economia e dei mercati*, Giappichelli, 2024; Biasi (a cura di), *Diritto del lavoro e intelligenza artificiale*, cit.

[38] On the concept of transnational labour law, Corazza, *Verso un nuovo diritto internazionale del Lavoro?*, in *DLRI*, 2019, 163, 3, pp. 487-498; Sanguineti Raymond, *Le catene globali di produzione e la costruzione di un diritto del lavoro senza frontiere*, in *DLRI*, 2020, 166, 2, pp. 187-226. On the concept of digital labour, Rudolf-Cibien, Pencolé, *What Should a Good Concept of Labour Do? The Case of Digital Labour*, in *ILLEJ*, 2024, 17, 2, pp. 45-65.

[39] EU Comm., 2018, 795 final; EU Comm., 2021, 205 final, 2.

[40] Ciucciovino, *Trattamento dei dati nell'ambito dei rapporti di lavoro*, in Aa.Vv., *Codice della privacy e data protection*, Giuffrè, 2021, pp. 947-956; Le Bonniec, *Another Path for AI Regulation: Worker Unions and Data Protection Rights*, in *ILLEJ*, 2024, 17, 2, pp. 115-131; Trojsi, *The confirmed, indeed reinforced, Centrality of the GDPR for the Protection of Workers' Personal Rights in the light of subsequent EU Legislative Acts*, in *ILLEJ*, 2024, 17, 2, pp. 355-370; De Lombaert, Rijal, Cos-

2024/2831 on platform workers[41], as well as that of the further ongoing regulatory hypotheses of liability regimes related to the use of artificial intelligence[42] is above all evident. Above all, in the specific field of product regulation, the Machinery Directive is closely linked to the AI Act and is intended to ensure that existing levels of worker protection when using work equipment are maintained, even when AI systems are used[43].

More specifically, the AI Act seems to add a further piece to the controversial path of identification between *workers' rights and human rights*[44]. In fact, it shares with other regulatory acts – the CSRD Directive and the CS3D Directive[45] – a vision of business activity that takes into account *shareholder value* together with its social externalities and, above all, the degree of exposure to risks of human rights violations.

In fact, the AI Act has provided for a specific and additional obligation of Fundamental Rights Impact Assessment (Fria), among which also those of workers, for some first-level deployers of the various AI systems[46]. The

TRASAL, MOLÈ, *Mass Collection of Workers' Data in Warehouse Facilities: Reflections on Privacy and Workforce Well-being*, in *ILLEJ*, 2024, 17, 2, pp. 145-168. On access to data by workers' representatives, GOULD, *Differential Privacy and Collective Bargaining over Workplace Data*, in *ILLEJ*, 2024, 17, 2, pp. 133-144.

[41] GIOVANNONE, *La direttiva sui "platform workers": regole multilivello e prospettive di attuazione*, in *LD*, 2025, 1, pp. 65-90.

[42] On the topic FAIOLI, *Assessing Risks and Liabilities of AI-Powered Robots in the Workplace*, cit.

[43] SENATORI, *EU Law and Digitalization of Employment Relations*, in GYULAVÀRI, MENEGATTI (eds.), *Decent Work in the Digital Age. European and Comparative Perspectives*, Hart-Bloomsbury, 2022, pp. 57-81; SENATORI, *Introduzione. L'AI Act: un nuovo tassello nella costruzione dell'ordinamento del lavoro digitale*, in SCAGLIARINI, SENATORI (a cura di), *Lavoro, Impresa e Nuove Tecnologie dopo l'AI Act*, in *QFondMB*, 2024, pp. 6-15.

[44] *Ex multis*, ALSTON, (ed.), *Labour Rights as Human Rights*, Oxford University Press, 2005; LEARY, *The Paradox of Workers' Rights as Human Rights*, in COMPA, DIAMOND (eds.), *Human Rights, Labor Rights and International Trade*, cit.; COLLINS, *The Role of Human Rights in Labour Law*, in COLLINS (ed.), *Putting Human Rights to Work*, Oxford University Press, 2022; BELLACE, TER HAAR, *Perspectives on labour and human rights*, cit.; FINKIN, *Worker rights as human rights: regenerative reconception or rhetorical refuge?*, cit.; COLLINS, MANTOVALOU, *Human Rights and the Contract of Employment*, cit.; PERULLI, BRINO (eds), *A Global Labour Law*, cit.; ALES, *Tracing the Social Sustainability Discourse within EU Law: the Success of the "Labour-Rights-as-Human-Rights" Approach*, cit., p. 30.

[45] Corporate Sustainability Reporting Directive - CSrD (Dir. 2022/2464/EU) and in the Corporate and Sustainability Due Diligence Directive (Dir. 2024/1760/EU). Both are currently being revised at the initiative of the European Commission (so-called Omnibus I package, cf. https://commission.europa.eu/publications/omnibus-i_en).

[46] Art. 27. In detail, this concerns deployers that are public law bodies or private entities

Fria regulatory technique represents one of the most innovative and disruptive profiles of the AI Act in the social sphere, in contrast to the traditional approach of the technical product regulation so far. First of all, it is potentially highly relevant for the protection of OSH and privacy, as well as anti-discrimination protection[47]. Secondly, Fria is in addition to conformity assessment, shifting part of the burden of dealing with potential negative consequences of AI to the primary users (first-level deployers) in relation to the specific and real operating context of such systems. Therefore, unlike conformity assessments and not having to comply with pre-established models and checklists, when adapting to the European discipline this obligation could be developed in closer connection with the already existing national provisions on the safety of work equipment, possibly also envisaging the involvement of workers' representatives[48].

At national level, Fria could thus be combined with the obligations of third parties[49] and those of the employer[50], and in particular with the risk assessment in respect of which Fria's technical assessment would be placed on

providing public services. On the subject of fundamental rights, Bassini, *Intelligenza artificiale e diritti fondamentali: considerazioni preliminari*, in M. Biasi (a cura di), *Diritto del lavoro e intelligenza artificiale*, Giuffrè, 2024, p. 23 ff.

[47] Regarding AI and anti-discrimination law, Barbera, *Discriminazioni algoritmiche e forme di discriminazione*, in *L&LI*, 2021, 7, 1, pp. I.1-I.17.; Barbera, *Principio di eguaglianza e divieti di discriminazione*, in Barbera, Guariso (a cura di), *La tutela antidiscriminatoria. Fonti, strumenti, interpreti*, Giappichelli, 2019, p. 59 ff.; Ballestrero, *Ancora sui rider. La cecità discriminatoria della piattaforma*, in *Labor*, 2021, 1, p. 104 ff.; Alessi, *Lavoro tramite piattaforma e divieti di discriminazione nell'UE*, in Alessi, Barbera, Guaglianone (a cura di), *Impresa, lavoro e non lavoro nell'economia digitale*, Cacucci, 2019; Perulli, *La discriminazione algoritmica: brevi note introduttive a margine dell'ordinanza del Tribunale di Bologna*, in *LDE*, 2020, 1, p. 1 ff.; Lo Faro, *Algorithmic Decision Making e gestione dei rapporti di lavoro: cosa abbiamo imparato dalle piattaforme*, in *Federalismi.it*, 2022, 25, p. 189 ff.; Gaudio, *Algorithmic management, poteri datoriali e oneri della prova: alla ricerca della verità materiale che si cela dietro l'algoritmo*, in *L&LI*, 2020, 2, pp. 19-71; De Petris, *La discriminazione algoritmica. Presupposti e rimedi*, in M. Biasi (a cura di), *Diritto del lavoro e intelligenza artificiale*, *op. cit.*, p. 225; Dumanĉ iĉ , Obadić , *Un'analisi di genere delle condizioni di lavoro e del diritto della protezione sociale nel lavoro su piattaforma digitale*, in *LLI*, 2024, 2, pp. 28-51; Kambouri, *Una critica intersezionale di genere alla Direttiva europea sulle piattaforme digitali*, in *LLI*, 2024, 2, pp. 52-76.

[48] On the role of representations in general and the new frontiers of participation see Maraga, *L'informazione sindacale nell'era dell'IA: verso nuovi spazi di partecipazione dei lavoratori nell'impresa?*, in *AD.it*, 1, 2025, pp. 1-18.

[49] Arts. 22, 23, 24 and 72 of d.lgs. No. 81/2008.

[50] Arts. 17, 28, 29 and 71 of d.lgs. No. 81/2008.

the first level deployer after the machine has been placed on the market, but before its introduction into the company.

4. *The twist with the Machinery Regulation*

In the same context of the EU competition law framework, the Machinery Regulation will apply to systems using AI technologies, once the previous Machinery Directive[51] is repealed.

Like the AI Act, it places a particular burden on the manufacturer. This figure, possessing detailed knowledge of the design and production process, holds a position of guarantee that obliges him to assess the conformity of the machine[52] and define the essential health and safety requirements of the same[53], while making available "precise and comprehensible information"[54] and specific accompanying documentation.

The Machinery Regulation also burdens the figures of the importer[55] and the distributor[56]: the former, as a person who places a product from a third country on the EU market; the latter, as a figure other than the manufacturer or importer, who makes a product available on the market. The importer has to make sure that the manufacturer has completed the appropriate procedures for conformity assessment of the product, taking personal responsibility for it. The distributor is responsible for verifying that the product is correctly identified and accompanied by the necessary documentation, taking due care in transport and storage so as not to compromise its conformity with the safety requirements.

With regard to safety components of equipment, as in the previous Directive, the Machinery Regulation requires that they are subject to CE marking. However, in the definition of safety components, it also includes digital components including software, extending for the first time the specific discipline to intangible equipment[57]. Furthermore, with regard to machines that

[51] On this subject also Elmo, *Sistemi IA e rischi per la salute e la sicurezza dei lavoratori: riflessioni a margine della regolamentazione europea*, in *AD.it*, 2024, 4, pp. 1-16.

[52] Recital 31, Arts. 10 and 25.

[53] Recital 32.

[54] Recital 39.

[55] Arts. 13-14.

[56] Art. 15 ff.

[57] Art. 3.

use AI systems, the regulation places the obligation of a risk assessment on the manufacturer, taking into account the evolution of their behaviour if they have certain levels of autonomy. In addition, new requirements are imposed to protect the health of workers against risks arising from the dynamics of human-machine interaction[58]. This assessment will have to take into account the evolution of the behaviour of machines operating with certain levels of autonomy, in accordance with the AI Act[59]. In perspective, such predictions appear to be particularly onerous for manufacturers. One only has to think of the technical measures to be taken in the face of autonomous machine behaviour, or of the cybersecurity solutions required for the safety of machinery employing AI software and systems connected to data networks. Moreover, with respect to human-machine integration, the safety requirements of mobile elements will have to be updated taking into account the most innovative solutions on collaborative applications, as imposed by the Regulation[60].

Well, given that the commercial regulation of work equipment today straddles the two Regulations, it is useful to understand how this regulatory interweaving will interact with the national prevention regulation. In particular, the set-up does not seem destined to change since the AI Act expressly refers to the harmonisation legislation and the Machinery Directive which, as of 20 January 2027, will be repealed by the new Machinery Regulation. Therefore, machines and products that fall within the scope of these measures must be declared compliant with them and their use must be integrated into the company's prevention system according to the national regulations already in force.

However, the Machinery Regulation also applies to old products that have undergone "substantial modification" by various users. These are those machines that, having been modified after being placed on the market or put into service, affect safety by increasing or creating a risk[61]. As in the case of AI systems, such hypotheses incorporate clear and direct responsibilities on the part of the various users, possibly including employers. Therefore, in

[58] On the challenge of finding assessment methods for risks generated by combined human-machine action, Treu, *Intelligenza Artificiale (IA): integrazione o sostituzione del lavoro umano?*, in *WP CSDLE "Massimo D'Antona"*, 2024, 487, p. 15.

[59] Annex II, Part B, para. 1.

[60] Annex III, Part B.

[61] Art. 3, co. 16.

the gradual implementation of the two regulations – AI Act and Machinery Regulation – it will be crucial to understand whether one is dealing with a newly manufactured machine, or a machine that, having been placed on the market under the previous regulation, has undergone such substantial changes over time. With respect to the latter, there is inevitably an obligation to assess the risks to the health and safety of persons (or animals)[62], together with the various obligations incumbent on the economic operators in the supply and use chain, of which the employer himself is a part.

Furthermore, it is possible to assume that the DVR (the Italian OSH risk assessment document) will be supplemented with specific technical annotations that will enable the guarantors of the prevention system to take into account the evolution of the behaviour of machines designed to operate with different levels of autonomy, on the basis of the manufacturer's technical indications. This is because of the importance that the self-learning process has acquired upstream, during the design and production of the AI system. In addition, when selecting work equipment, the employer must take into account the specific conditions and characteristics of the work to be performed, the risks present in the work environment and those arising from the use of the machinery, as well as those arising from interference with other equipment already in use (in a combined reading of Articles 28 and 71 of Legislative Decree No. 81/2008)[63]. Moreover, this employer's guarantee position derives directly from Directive 391/89/EEC, which imposes a general obligation on employers to ensure the health and safety of workers "in every aspect related to the work"[64]. To reinforce this interpretation, this general obligation has been further clarified by the EU Court of Justice, according to which the employer is required to assess all risks existing in the workplace that are "continually changing in relation, particularly, to the progressive development of working conditions and scientific research concerning such risks"[65].

Then, in order to minimise the risks, the employer must take appropriate technical and organisational measures (including those of Annex VI) and

[62] Recital 26.

[63] On the coordination between d.lgs. n. 81/2008 and the Machinery Regulation see D'Arcangelo, *Robotica e lavoro. Prime osservazioni in tema di sicurezza (delle macchine e dei lavoratori)*, in *Federalismi.it, focus LPT*, n. 6/2025, pp. 83-104.

[64] Art. 5, co. 1.

[65] CJCE 15 november 2001 aff. C-49/00, *Commission vs Italy*, § 13.

the necessary measures so that the equipment: is installed and used in accordance with the instructions for use; is subject to control and appropriate maintenance; and is subject to the measures for updating the minimum safety requirements. In addition, the use of equipment must be restricted to workers who have received adequate information, training and instruction.

From this brief reconstruction it emerges that the employer's position of guarantee is highly articulated and can be invoked with reference to distinct time segments of the work organisation process, following the introduction of the equipment into the company.

This guarantee position is clearly distinct with respect to that of third parties to the company (designers, manufacturers, suppliers, installers and assemblers), respectively in the preliminary and subsequent phases following the placing on the market, or the introduction into the company of the equipment itself.

The same safety requirements imposed by EU Regulation No. 2023/1230 and EU Regulation No. 2024/1689 keep this distinction clear. Furthermore, with regard to the obligation to provide training, information and instruction to workers[66], the general literacy requirement introduced by Article 4 of the AI Act may require training courses to be supplemented with information on how AI systems work. The introduction of the new obligation of education and training for the employer who makes use of equipment requiring special knowledge (Art. 71, para. 7, Legislative Decree No. 81/2008), in order to ensure its use in a suitable and safe manner (Art. 73, para. *4-bis*) seems to point in this direction[67]. Among other things, the same legislative intervention provided that the hirers and lenders in use must acquire and keep on file a self-certifying declaration by the party hiring, leasing or using, or by the employer, attesting to the specific training and instruction of the persons identified for use (Art. 72, para. 2, second sentence). This provision reinforces the logic of empowerment of the supply chain.

Ultimately, the new duties of a technical-procedural nature introduced by the regulations flank the more traditional prevention duties, without absorbing them. Consequently, in the wake of product and social discipline, the guarantee positions of the actors involved must be kept quite distinct.

[66] Art. 73, d.lgs. No. 81/2008. Consider also the managerial training obligation set out in Art. 37, para. 7, d.lgs. No. 81/2008 (currently awaiting implementation through the special State-Regions Agreement).

[67] D.l. No. 48/2023 converted with amendments by L. No. 85 of 3 July 2023.

5. *The use of machines equipped with AI: employers' and external actors' liability in the Italian OSH system*

At this point, the question arises as to whether this "regulatory mosaic" can guarantee a certain delimitation of the OSH obligation and an adequate level of protection of workers' health and safety[68].

Firstly, it cannot be ruled out that the traditional criteria for attributing liability in OSH matter will be taken into account in an evolutionary way by case law[69]. At the same time, collective bargaining could develop modal rules that circumscribe the tasks of the various health and safety actors[70].

[68] On this topic also the insights of Faioli, *Assessing Risks and Liabilities of AI-Powered Robots in the Workplace*, cit., p. 79 ff.; Faioli, *Robot Labor Law. Linee di ricerca per una nuova branca del diritto del lavoro e in vista della sessione sull'intelligenza artificiale del G7 del 2024*, in *Federalismi.it*, 2024, 8, p. 182 ff.; Malzani, *Tassonomia UE e vincoli per l'impresa sostenibile nella prospettiva prevenzionistica*, in *DLRI*, 2023, pp. 177-178, p. 75 ff.; Marinelli, *Verso una Fabbrica Intelligente: come l'AI invita a ripensare la tutela della salute e della sicurezza dei lavoratori*, in *VTDL*, 2023, 4, p. 828 ff.

[69] On case law practice, Adams-Prassl, Laulom, Maneiro Vàsquez, *Il ruolo dei tribunali nazionali nella protezione dei lavoratori delle piattaforme: un'analisi comparata*, in Miranda Boto, Bramseshuber, Loi, Ratti (a cura di), *Contrattazione Collettiva e gig economy. Uno strumento tradizionale per nuovi modelli di organizzazione*, Giappichelli, 2022, p. 83 ff. Also, Esposito, *Ciclo produttivo digitalmente integrato e responsabilità datoriali: appunti sull'effettività delle tutele*, in *Federalismi*, 2022, 25, pp. 95-103 who comments on the contribution of some merit judgments such as Trib. Padova 16 July 2019 differently from Cass. 2 November 2021 No. 31127 and No. 31128. On the notion of "employer" in the face of the fragmentation/disarticulation of the productive organisation, Carinci, *Processi di ricomposizione e di scomposizione dell'organizzazione: verso un datore di lavoro "à la carte"?*, in *DLRI*, 2016, 152, pp. 733-747; Alvino, *Il lavoro nelle reti di imprese: profili giuridici*, Giuffrè, 2014; Auriemma, *Il datore di lavoro nell'evoluzione dell'impresa complessa*, Edizioni Scientifiche Italiane, 2022; Basenghi, *Assetti societari e individuazione del datore di lavoro per la sicurezza*, in Campanella, Pascucci (a cura di), *La sicurezza sul lavoro nella galassia delle società di capitali*, in *I WP di Olympus*, 2015, 44, pp. 27-33.

[70] On the new regulatory spaces for collective bargaining and partecipation, Faleri, *Prove di democrazia partecipativa per le rappresentanze dei lavoratori nella transizione digitale*, in *RGL*, 2024, 4, p. 608 ff.; Aa.Vv. (a cura di), *Sistemi di prevenzione, partecipazione e rappresentanza dei lavoratori nel tempo della trasformazione digitale*, Franco Angeli, 2024; Delfino, *Lavoro mediante piattaforme digitali, dialogo sociale europeo e partecipazione sindacale*, in *Federalismi.it*, 2023, 25, p. 171 ff.; Timellini, *Verso una Fabbrica Intelligente: come l'AI invita a ripensare la tutela della salute e della sicurezza dei lavoratori*, in *VTDL*, 2023, 4, p. 841; Corti, *Intelligenza artificiale e partecipazione dei lavoratori. Per un nuovo umanesimo del lavoro*, in *DRI*, 2024, 3, p. 615 ff.; Biasi, *Il lavoro nel disegno di legge governativo in materia di intelligenza artificiale: principi, regole, parole, silenzi*, in *DRI*, 2024, 3, p. 662; Rota, *Sull'Accordo quadro europeo in tema di digitalizzazione del lavoro*, in *L&LI*, 2020, 6, 2, p. C.25 ff.; Spinelli, *Industrial Relations Practices in the Digital Transition: What Role for the Social Partners?*, in this journal, 2024, 2, pp. 461-476; Cristofolini, *Digital Trade Unionism in the Making?*

It is therefore necessary to analyse the legal validity of the traditional OSH regulations on "external parties" to the company (Articles 22, 23, 24 and 72 of Legislative Decree No. 81/2008)[71], as well as the criteria for apportioning liability between the latter and the employer, developed over time by case law. As a matter of fact, it is well known that, at the impetus of European legislation, Legislative Decree No. 81/2008 extended the duty of safety to the design, construction and supply phases of machinery to be used in the working environment with a specific liability, criminally sanctioned, of designers, manufacturers, suppliers and installers.

For its part, the inter-subjective allocation of responsibility between these parties and the employer has been addressed by establishing that, if the latter uses (or causes to be used) machinery that does not comply with current legislation, it shall be jointly liable with the manufacturer (or with the other parties indicated), unless the defect is unknown and cannot be recognised with normal diligence, even in relation to the certification obligations[72].

Insights from the Italian Experience, in this journal, 2024, 2, pp. 395-420. On the first contractual experiments in the field of AI, Imberti, *La contrattazione collettiva aziendale di fronte alle sfide della rivoluzione digitale e ai processi di cambiamento organizzativo*, in *Federalismi.it*, 2022, 25, p. 161 ff.; Faioli, *Perché regolare le relazioni industriali e le tutele giuslavoristiche in relazione all'intelligenza artificiale. Le sfide più complesse nel settore del credito tra rinnovo contrattuale del 2023 e dichiarazione congiunta europea del 2024*, in *Federalismi.it*, 2024, 30, p. 207 ff.; Lamannis, *La contrattazione collettiva aziendale alla prova del management algoritmico*, in Gargiulo, Saracini (a cura di), *Parti sociali e innovazione tecnologica*, in *Quaderni* in this journal, 2023, 15, p. 163 ff. In a comparative perspective, Corti, *Innovazione tecnologica e partecipazione dei lavoratori: un confronto tra Italia e Germania*, in *Federalismi.it*, 2022, 17, pp. 113-123. On the defence of collective interests, in remedial proceedings, Zappalà, *Intelligenza artificiale, sindacato e diritti collettivi*, in Biasi (a cura di) *Diritto del lavoro e intelligenza artificiale*, cit., p. 200; Protopapa, *Sindacato e nuove azioni di "classe"*, in *LD*, 2024, 2, p. 257; Razzolini, *Class action: l'azione in giudizio del sindacato verso un cambio di paradigma*, in *RIDL*, 2023, 1, p. 111; Imberti, *Intelligenza artificiale e sindacato. Chi controlla i controllori artificiali?*, in *Federalismi.it*, 2023, 29, p. 200; Recchia, *Condizioni di lavoro trasparenti, prevedibili e giustiziabili: quando il diritto di informazione sui sistemi automatizzati diventa uno strumento di tutela collettiva*, in *LLI*, 2023, 9, 1, p. R. 32; Zoppoli, *Prospettiva rimediale, fattispecie e sistema nel diritto del lavoro*, Editoriale Scientifica, 2022; Comandè, *"Grande è la confusione sotto il cielo" dei rider: strategie sindacali e chiavi di accesso alle tutele giudiziali*, in *RIDL*, 2023, 4, p. 559; Gaudio, *Algorithmic management, sindacato e tutela giurisdizionale*, in *DRI*, 2022, 1, p. 30; Tullini, *L'economia digitale alla prova dell'interesse collettivo*, in *LLI*, 2018, 4, 1, p. 1.

[71] On the topic, Volpe, *Sicurezza organizzata e soggetti esterni all'azienda*, in *DSL*, 2016, 2, pp. 11-17; Vallebona, *Responsabilità civile dell'imprenditore. Appalti. Responsabilità dei progettisti, fabbricanti, fornitori e installatori*, in Montuschi (a cura di), *Ambiente, salute e sicurezza. Per una gestione integrata dei rischi di lavoro*, 1997, p. 204 ff.

[72] Cf. Cass. Pen. 27 September 2001 No. 35067.

It follows that the manufacturer's liability does not exclude the liability of the employer who is the user of the machinery, since the latter is obliged to eliminate sources of danger for the workers called upon to use it[73]. Therefore, when assessing joint liability in this matter, the existence of obligations incumbent on "external" parties does not exclude the employer's duty to verify the safety of the machinery it makes available[74]. On the other hand, in the event of non-compliance of the machinery with the relevant safety standards, an external party cannot invoke the imprudent behaviour of the user/purchaser of the machinery to their own advantage[75].

That being said, the determination of the degree of liability of the employer and of the other holders of positions of guarantee, in the event of injuries to physical and psychological integrity attributable to defective machines using IA systems, should not disregard these hermeneutical canons. Rather, in court proceedings, the judge may find himself in the particular position of having to assess, among the elements of his own conviction, the technical classification of the levels of autonomy of the AI system, as developed during its design, construction and placing on the market. This is to figure out if the algorithmic intermediation of the machine used by the worker can be considered the only cause of the harmful event, how much production, design, or modification defects played a role, either alone or together, and, lastly, if it was due to the employer not following their specific obligations during risk assessment, use, maintenance, and training. Finally, it is possible to find contributory negligence on the part of the worker, which may relieve the employer of his responsibilities[76]. Therefore, in the event of breach of one or more of these obligations, it is difficult to hypothesise that the employer could be relieved of responsibility, since the employer will be legally liable for the malfunctioning of the machine mediated by the AI system[77]. However, this guarantee position could be progressively weakened if the other causal factors mentioned above prevail.

[73] Cf. Cass. Pen 13 January 2006 No. 1216; Cass. Pen. 9 July 2008 No. 27959.

[74] Cf. Cass. Pen. 21 June 2004, No. 27808.

[75] Cf. Cass. Pen. 5 March 2003 No. 41985; Cass. Pen. 23 July 2008 No. 30818.

[76] On worker cooperation in OSH for the use of AI, PASCUCCI, *Sicurezza sul lavoro e cooperazione del lavoratore*, in *DLRI*, 2021, 3, p. 421.

[77] In favour of "upstream" liability in the hands of designers, manufacturers, suppliers and installers, CAIROLI, *cit.*, p. 35 ff. However, SQUEGLIA, *Obiettivi, strumenti e metodi dell'intelligenza artificiale nella tutela della salute e della sicurezza dei lavoratori*, in *DSL*, 2025, 1, p. 127 ff. reiterates the immovable (criminal) responsibility of the employer.

On the other hand, precisely with regard to the damage caused by AI systems used as components of machines with an increasing degree of autonomy, the controversial hypothesis of attributing legal personality to AI has arisen, as a remedy to the risk of excessive liability on the part of employers, manufacturers and suppliers[78]. This was the direction taken by the 2017 European Parliament Resolution in relation to robots deemed to be agent systems[79]. The founding hypothesis of a legal personality of the machine would not imply its personification, assuming rather a functional (and evidential) value. It would be a suitable mechanism to allow the imputation of effects directly to the machine, with an easing of criminal law profiles and of the burden of compensation on physical persons[80], also in a logic of greater economic sustainability. In Italy, a similar *fictio* is represented by the liability of entities under Legislative Decree No. 231/2001 and Article 30 of Legislative Decree No. 81/2008[81].

The prospect, not free from perplexity[82], tends towards a compromise regulatory solution, in any case without relieving the employer, designers, manufacturers and suppliers of their respective prevention obligations. This would involve hypothesising, on the basis of a case-by-case risk assessment, the degree of effective residual human control over AI, up to and including

[78] For an analysis on the prospects of attributing legal personality to Faini, *Intelligenza artificiale e regolazione giuridica: il ruolo del diritto nel rapporto tra uomo e macchina*, in *Federalismi.it*, 2023, 2, pp. 1-29; Faioli, *Data analytics, robot intelligenti e regolazione del lavoro*, cit., p. 153 ff. *Contra*, Tenore, *Riflessioni sulle diverse questioni giuridiche ed esistenziali derivanti dal crescente utilizzo di intelligenze artificiali*, in *DRI*, 2024, 3, p. 666 ff.

[79] European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics. In the same vein, European Parliament resolution of 20 January 2021 on artificial intelligence: questions of interpretation and application of international law in so far as the EU is affected in the areas of civil and military uses and of state authority outside the scope of criminal justice. *Contra*, the European Economic and Social Committee in its position of 31 May 2017, published on 31 August 2017.

[80] Thus the perspective of Alpa, *Quale modello normativo europeo per l'intelligenza artificiale?*, in *CI*, 2021, 4, pp. 1003-1026.

[81] On the appropriateness of enhancing the Organisation and Management Models (MOG) referred to in d.lgs. No. 231/2001 in the face of the challenges posed by IA, Lazzari, Pascucci, *Sistemi di IA, salute e sicurezza sul lavoro: una sfida al modello di prevenzione aziendale, fra responsabilità e opportunità*, in *RGL*, 2024, 4, p. 596 ff.; Ciucciovino, *La disciplina nazionale sulla utilizzazione della intelligenza artificiale nel rapporto di lavoro*, in *LDE*, 2024, 1, pp. 18-19.

[82] On the peculiarity of techniques for assessing the risk of committing predicate offences and the difficulties of transferring this model to assess "new" risks, Treu, *Il controllo umano delle tecnologie: regole e procedure*, in *WP CSDLE "Massimo D'Antona"*, 2025, 492, p. 16.

more extreme scenarios in which such control no longer exists or only intervenes at such a late stage in the decision-making and management process that it compromises the strong causal link between the employer's conduct and the harmful event.

While waiting for more solid interpretative constructs[83], the fact remains that employers, when preparing their DVR and planning prevention and protection measures, must at least take into account the different degrees of autonomy and pervasiveness of AI, as certified by the manufacturer. In this way, when assessing risks, the employer will be able to make probabilistic predictions on the "conduct" of the digitised system, enabling him to draw up appropriate prevention and organisational protocols. In this way, his liability could be graduated for facts that are causally attributable to technically unforeseeable risks or for those attributable to the "fact of the third party"[84]. In any case, the prerequisite should be that the employer, workers and their representatives have received adequate preliminary training on the specific technical aspects of AI, with a view to participatory management of technological risk[85].

6. *Concluding remarks*

Looking at the two Regulations' contents and objectives, it's clear that the need to create a single market for AI prevails, ensuring that the related devices are safe and respectful of the fundamental rights and values of the European Union. These objectives must be achieved in a clear logic of reconciliation between social rights and market protection; this explains the

[83] On the limits of the regulatory solutions proposed by the new Directive (EU) 2024/2853 on liability for defective products, CRUDELI, *Sistemi di intelligenza artificiale autonomi e responsabilità datoriale*, in *DSL*, 2024, 2, p. 408 ff.

[84] In more detail, see GIOVANNONE, *Responsabilità datoriale e prospettive regolative della sicurezza sul lavoro. Una proposta di ricomposizione*, cit., p. 177 ff.

[85] In this sense also LAZZARI, PASCUCCI, *cit.*, p. 590; ROTA, *cit.*, p. C. 30 ff. In general, on the difficulties of disseminating the participatory method in the company prevention dimension, among others, ALES, *La tutela della salute sul lavoro nel prisma del metodo partecipativo, in Tutela della salute pubblica e rapporti di lavoro*, in ZOPPOLI (a cura di), in *Quaderni* in this journal, 2021, 11, pp. 231-250; ANGELINI, *Rappresentanza e partecipazione nel diritto della salute e sicurezza dei lavoratori in Italia*, in *DSL*, 2020, 1, p. 96 ff. On the general role of representation and the new frontiers of participation, MARAGA, *L'informazione sindacale nell'era dell'IA: verso nuovi spazi di partecipazione dei lavoratori nell'impresa?*, in *AD.it*, 1, 2025.

joint reference to the EU Charter of Fundamental Rights and the EU's international trade commitments. Consequently, given that the use of AI systems may entail risks to fundamental rights, it is necessary to adopt a system of rules relating to the characteristics that they must possess before they are placed on the European market. On this basis, the AI Act introduces a risk-based procedural regulatory model and a series of obligations, mainly for providers of AI systems, to be fulfilled before being placed on the European market.

Similarly, the Machinery Regulation seems to be moving which, unlike the old directive, also applies to products that have undergone substantial changes and not only those of new production. These are those products that, modified after being placed on the market or in service, impact safety, increasing or creating a risk. The reference therefore goes to those equipment that require the adoption of repairs or additional protective devices. The Regulation thus also refers to machines that use artificial intelligence, introducing an obligation to assess risks that takes into account the evolution of their behaviour if they are equipped with certain levels of autonomy and the imposition of new safety and health protection requirements for workers against risks originating from the dynamics of human-machine interaction. In addition, specific protective devices and specific tools for safe unlocking and the corresponding instructions for use must be provided. Moreover, the prevention of contact risks that determine dangerous situations and of the psychic tensions that can be caused by interaction with the machine must be adequate in relation to the coexistence of man and machine in a shared space in the absence of direct collaboration and to the interaction between man and machine. On this basis, an obligation to assess the risks to the health and safety of humans or animals is envisaged, which obliges all economic operators involved in the supply and distribution chain. However, the function of manufacturers remains particular who, possessing detailed knowledge of the design and production process, hold a position of guarantee that obliges them to assess the conformity of the machine: a requirement that should remain the exclusive responsibility of the manufacturer. Following that assessment, the manufacturer should also establish the applicable essential health and safety requirements, in relation to which measures must be taken to address the risks.

Consequently, where the machine integrates an AI system, the assessment should include the risks that may arise during its life cycle due to an

expected evolution of its behaviour to operate with different levels of autonomy; it will therefore have to be carried out in accordance with the AI Regulation. At this point, it is not lost on us that the two acts integrate in order to more clearly identify the subjects responsible for the obligations of assessment, management and minimization of risks. It is also true that the directive on platform work is integrated with both for the identification of rights and protection needs deriving from the use of digital technologies and AI systems.

On the other hand, coming to the Italian system, it seems to be clear that Legislative Decree No. 81/2008 has extended the OSH debt to the design, construction and supply phases of machinery to be used in the workplace with a specific liability, criminally sanctioned, of designers, manufacturers, suppliers and installers.

For its part, case law has long addressed the inter-subjective division of responsibility between these subjects and the employer, establishing that if the latter uses (or causes to be used) an unsuitable machine, because it does not comply with the regulations in force, he participates in liability with the manufacturer (or with the other parties indicated), unless the defect is unknown and not recognizable with normal diligence, also in relation to the required certification obligations. It follows that the manufacturer's liability, in the event that the harmful event was caused by failure to observe accident prevention precautions in the design and manufacture of the machinery, does not exclude the liability of the employer using the same, since he is obliged to eliminate the sources of danger for the workers called upon to use it. Therefore, in assessing the concurrence of liability in the matter, on the one hand, the existence of the obligations incumbent on the "external" parties does not exclude the employer's duty to ascertain the regularity of the machinery he uses or causes to be used; on the other hand, in the event of noncompliance of the machinery with the reference safety standards, the external party cannot invoke the imprudent behaviour of the user/purchaser of the same to its advantage.

Also in the light of these hermeneutical canons it is clear that the determination of the degree of responsibility of the employer and other holders of guarantee positions, in the event of injuries to physical and mental integrity resulting from the use of AI, cannot disregard a classification of the levels of autonomy of this and its heterogeneous applications, in order to provide suitable operating rules and identify prevention standards useful for

parameterizing employer obligation and liability. In fact, even in the face of algorithmic intermediation in the exercise of decision-making powers, a de-responsibility of the employer is unthinkable since every management act, even if mediated by AI systems, is always legally attributable to the same.

On the other hand, the Artificial Intelligence Bill No. 1146, approved by the Senate of the Italian Republic last March 2025[86], seems to be moving in this direction, also on the basis of the indications coming from the Survey on the relationship between Artificial Intelligence and the world of work[87], with particular reference to the impacts that generative artificial intelligence may have on the labour market.

[86] See in particular Arts. 10 and 11.

[87] *Indagine conoscitiva sul rapporto tra Intelligenza Artificiale e mondo del Lavoro*, published by the Italian Parliament in June 2024 followed by the final report *Linee guida per l'implementazione dell'intelligenza artificiale nel mondo del lavoro*, released by the Italian Ministry of Labour in June 2025.

Abstract

The essay analyses the AI Act in the frame of EU machinery requirements regulation starting from the labour rights as human rights international debate and then exploring its possible impact on the Italian OSH legislation with particular reference to the employer's obligation to assess risks and the safety requirements of work equipment, referred to in Title III of Legislative Decree No. 81/2008. In envisaging the adaptation of the prevention discipline to the AI Act, account is taken of the essential link between it and the entire European technical harmonization legislation and, in particular, with Regulation (EU) No. 2023/1230 (Machinery Regulation). On this conceptual basis, the contribution also explores the compatibility of the aforementioned regulatory interweaving with the parameters for assessing the liability of the employer, designers, manufacturers and suppliers developed by the case law in implementation of the aforementioned provisions of Legislative Decree No. 81/2008.

Keywords

EU frame on digital economy, Labour rights as human rights, AI Act, Working machinery's OSH requirements, OSH risk assessment, Employers', Manufacturers' and supply chain actors' liability.