

Legal challenges arising from using AI systems in the workplaces

التحديات القانونية الناشئة عن استخدام أنظمة الذكاء الاصطناعي في أماكن العمل

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Abstract :

The rapid integration of AI into workplaces has unveiled legal gaps as outdated labor laws struggle to address risks like algorithmic bias, unjust layoffs, and murky liability standards. Accelerated technological progress has outstripped traditional regulatory frameworks, leaving workers vulnerable to inequitable practices and ambiguous accountability in AI-driven decisions. This research underscores AI's disruptive influence on labor dynamics, exposing how human-centric legal systems fail to govern automated processes, particularly in assigning responsibility for algorithmic outcomes. It advocates urgent reforms to modernize labor protections, emphasizing the need to redefine accountability and transparency in AI governance. Ultimately, legislative innovation is critical to bridge these gaps, ensuring equitable safeguards and adaptive liability norms in an era of workforce automation.

Keywords : Artificial intelligence systems; labor law; Worker; Employer; Legal liability

ملخص:

في مواجهة انتشار استخدام نظم الذكاء الاصطناعي داخل أماكن العمل والتي فرضت العديد من التحديات القانونية، فإنه من الضروري إعادة التفكير في مدى نجاعة الأدوات القانونية المتاحة من أجل ضمان حماية العمال من غزو هذه الأنظمة، حيث أدى ادماج نظم الذكاء الاصطناعي داخل أماكن العمل الى ابراز العديد من الثغرات القانونية الناجمة عن التفاوت بين التقدم التكنولوجي والآليات القانونية المخصصة لحماية حقوق العمال،

تهدف هذه الدراسة الى ابراز الابرار أهم التحديات القانونية التي تواجه علاقات العمل في ظل انتشار استخدام نظم الذكاء الاصطناعي وكذا تأثيرها المحتمل على حقوق العمال، وتخلص الى ضرورة تعديل الأطر القانونية الحالية للعمل المصممة لأماكن العمل المخصصة للبشر والتي أصبحت عاجزة عن التماشي مع التبعات القانونية للغزو الخوارزمي لمناصب العمل، بما يتماشى مع تطورات هذه الأنظمة ولا سيما فيما يتعلق بالمسؤولية الناجمة عنها.

الكلمات المفتاحية: نظم الذكاء الاصطناعي؛ قانون العمل؛ رب العمل؛ العامل؛ المسؤولية القانونية.

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Introduction:

Although technology has long shaped the nature of work, artificial intelligence (AI) is now fundamentally transforming employment not only in terms of working conditions but also the very essence of labor itself. As AI systems increasingly replace human roles, a significant risk emerges: the polarization of the labor market, with skilled jobs being eroded in favor of low-value-added positions. This shift affects sectors unevenly, with technical and scientific fields, financial services, and information and communication technology (ICT) professions facing the greatest disruption. Yet, AI's rise has also spurred innovation, reshaping not just the labor market but also labor relations and the civil liability frameworks governing them.

The swift incorporation of Artificial Intelligence (AI) into the workplace is redefining employment contracts and labor relations, introducing novel legal challenges that current frameworks struggle to accommodate. As AI takes on a greater role in automating tasks, overseeing workflows, and making employment-related decisions, the conventional distinctions between workers, employers, and technology are becoming increasingly blurred. This shift raises pressing concerns regarding liability, fairness, and worker protection in an era where algorithms shape hiring processes, performance assessments, and even dismissals. The importance of this issue stems from its profound impact on labor rights, corporate responsibility, and the adaptability of regulations in response to technological advancements.

The interplay between AI, labor law, and civil liability remains complex and poorly defined. Despite AI's pervasive integration into workplaces, labor regulations and liability standards have been slow to adapt, leaving critical gaps in addressing its legal implications. This raises a pressing question: How effective are existing legal mechanisms in confronting the challenges posed by AI-driven labor transformations?

Artificial intelligence (AI) has become deeply embedded in the workplace, transforming tasks once exclusively managed by humans from payroll processing and shift scheduling to more complex functions such as workforce coordination and performance assessment. The literature highlights that AI's impact on labor stems from its ability to collect, process, and analyze vast amounts of data to execute specific actions autonomously. Its applications range from optimizing industrial processes and machinery to assessing customer risks, monitoring workplace safety, and even predicting employees' potential health risks—such as occupational diseases through genetic analysis. This shift extends beyond mere administrative efficiency; AI now performs roles traditionally considered irreplaceably human, including algorithmic management in labor relations, where it autonomously plans, evaluates, and makes decisions affecting workers. While AI can enhance productivity and even improve employee health outcomes, its pervasive integration raises critical legal and ethical concerns. The silent yet seismic expansion of AI into workplace decision-making demands urgent regulatory safeguards to mitigate destabilizing effects, protect workers' rights, and address the emerging, uncharted dynamics between employees and autonomous systems..

The significance of this subject cannot be overstated, as it carries transformative implications for both the future of work and the foundations of legal accountability in employment relations. AI-driven workplace technologies present fundamental challenges to established notions of transparency, non-discrimination, and contractual equity. These innovations, while potentially efficiency-enhancing, threaten to institutionalize workplace disparities, destabilize employment protections, and create troubling voids in legal responsibility when disputes involving AI systems inevitably emerge. The absence of robust regulatory frameworks risks permitting these technologies to undermine decades of labor protections, potentially relegating workers to increasingly precarious positions in algorithmically-driven employment ecosystems.

This article employs a comprehensive descriptive-comparative methodology to examine the impact of artificial intelligence (AI) systems on employment contracts and liability frameworks in the labor sector. The study seeks to propose legal adjustments that strike a balance between safeguarding workers' rights and protecting employers' interests.

The aforementioned problem was answered according to a systematic division, as the first section explores the legal challenges posed by AI integration in employment contracts, and the second section investigates liability issues arising from AI applications in the workplace

1-Challenges of applying artificial intelligence systems at the level of labour contracts

The integration of artificial intelligence into employment contracting is revolutionizing traditional practices while introducing novel challenges across the entire contract lifecycle. From algorithmic hiring systems that screen candidates to automated termination processes and AI-powered contract enforcement, these technologies are fundamentally altering workplace dynamics. This transformation raises pressing concerns about equitable treatment, decision-making transparency, and adherence to established labor protections.

As organizations increasingly delegate employment decisions to machine learning systems, critical issues emerge regarding potential discrimination in recruitment and the absence of human oversight in contractual matters. The growing reliance on these technologies necessitates careful consideration of how to maintain fair labor standards while harnessing AI's efficiency benefits.

This examination focuses on these dual challenges, emphasizing the urgent need for regulatory approaches that both accommodate technological innovation and safeguard essential worker rights in the digital age.

1.1- Legal Challenges of Maintaining Employment Positions Amid AI Adoption

The rise of AI in the workplace challenges key employment laws, particularly around hiring and firing processes. Current legal frameworks must be reassessed to protect workers from AI-driven job losses. There is also a need to ensure long-term job security as automation reshapes industries. Policymakers should examine whether existing rules prevent unfair AI-based terminations. Additionally, laws must adapt to guarantee workers' future employability in an AI-dominated economy.

1.1.1- Legal safeguards to minimise redundancies motivated by technological changes

Technological changes are one of the main justifications enabling employers to resort to economic dismissal, reflecting the contradiction between innovation and worker protection in modern labor law. In France, this principle is explicitly codified in Article L. 1233-3 of the French Labor Code, which defines economic dismissal as an employer-initiated termination of employment for economic reasons unrelated to the employee's personal conduct. This provision explicitly identifies technological developments such as automation, digital transformation, or the adoption of artificial intelligence systems as legitimate grounds for eliminating or restructuring jobs. For example, an employer may terminate jobs rendered obsolete by AI-driven automation, provided that such changes are deemed necessary to protect the company's competitiveness. The law also stipulates that such dismissals may arise from the elimination or change of job roles¹, the employee's refusal to accept substantial modifications to their employment contract (such as retraining requirements related to new technologies), or direct technological changes that fundamentally alter workflow or operational needs.

In contrast, Algerian labor legislation lacks a legal definition of economic dismissal or a comprehensive list of permissible grounds for such terminations. This regulatory ambiguity has forced legal scholars to bridge this gap through doctrinal interpretations. Algerian academic commentary have consistently emphasized that technological changes-including the integration of artificial intelligence systems- are considered a legitimate economic justification for workforce reductions², provided employers demonstrate objective necessity and proportionality. This doctrinal approach is implicitly aligned with the French model, which emphasizes the transnational recognition of technological progress as valid incentives for restructuring labor relations in response to evolving economic realities. However, Algeria's reliance on judicial interpretation, rather than codified rules, creates legal ambiguity, leaving workers and employers vulnerable to conflicting rulings.

Despite their different legislative frameworks, both jurisdictions impose strict procedural safeguards to prevent the abuse of economic dismissals linked to technological change. In Algeria, employers initiating layoffs must submit a detailed report to labor authorities, justifying the dismissals and documenting previous efforts to avoid dismissals, such as reducing working hours, redeploying employees, or exploring alternative solutions such as gradual retraining programs³. Similarly, French law requires employers to develop an effective "adaptation plan" when pursuing technological restructuring. This plan must include measures such as employee retraining, internal redeployment, and partnerships with professional associations to facilitate workforce transitions. Employers are also required to consult with workers' representatives (the Social and Economic Committee) during the planning phase, ensuring transparency and collective contributions⁴.

In this context, judicial oversight should play a crucial role in both systems, albeit with varying degrees of precision. In France, courts are rigorously examining whether dismissals related to artificial intelligence or automation are truly inevitable. Judges assess whether employers have exhausted all alternatives such as redeploying workers to new jobs or delaying layoffs through furloughs before terminating contracts⁵. In Algeria, while judicial review exists, the absence of explicit legal standards often leads to fragmented interpretations.

Legal scholars increasingly argue that continuous training and workforce adaptation are not just recommended practices, but fundamental legal obligations in the digital age. As artificial intelligence reshapes industries, fixed job roles are becoming unsustainable, necessitating a radical shift in labor law⁶. In France, the 2018 Law on the Future of Work strengthened employer's obligations to fund lifelong learning, directly linking skills development to technological adaptation⁷. However, Algerian labor law has been slow to formalize these obligations, and it is therefore imperative that Algeria codify employers' retraining obligations to align with global standards, ensuring that workers are not disproportionately penalized for disruptions caused by AI.

1.1.2. Legal Guarantees for Future Employability in the Age of AI

The rapid integration of artificial intelligence into the global economy is fundamentally reshaping the nature of work, demanding a paradigm shift in how individuals and institutions prepare for the future of labor. In this emerging AI-dominated landscape, workers must strategically differentiate themselves by cultivating and emphasizing intrinsically human capabilities such as creative problem-solving, nuanced ethical reasoning, and sophisticated emotional intelligence to maintain a sustainable competitive advantage against increasingly capable automated systems⁸. This imperative extends beyond individual adaptation to require systemic, policy-driven interventions that collectively reinforce workforce resilience.

A comprehensive approach to workforce development in the age of AI must address multiple dimensions of preparation and adaptation. At the foundational level, education systems worldwide require substantial transformation to embed AI literacy, data science fundamentals, and computational thinking across all levels of instruction from primary schooling to professional continuing education⁹. This educational overhaul should not merely focus on technical proficiency but must also foster critical digital citizenship, enabling learners to understand, question, and ethically engage with AI systems that increasingly mediate professional and social interactions¹⁰.

Equally crucial is the establishment of robust public-private partnerships that bridge the gap between evolving industry needs and workforce capabilities. Such collaborations should facilitate continuous skills development through modular, accessible training programs that allow workers to adapt to technological disruptions throughout their careers¹¹. These initiatives must be complemented by legislative frameworks that guarantee equitable access to upskilling opportunities, particularly for vulnerable populations at highest risk of job displacement. Policies should incentivize employer investment in workforce development while ensuring protections against algorithmic bias and other forms of digital marginalization¹².

The European Centre for the Development of Vocational Training (Cedefop) underscores that these proactive measures are not merely optional enhancements but existential necessities for preserving meaningful human agency in the workplace. Their research indicates that nations which delay implementing such strategies risk exacerbating skills gaps, deepening socioeconomic inequalities, and losing competitive positioning in the global knowledge economy¹³.

National education and labor policies must therefore pursue a dual transformation: systematically developing technologically-adaptable professionals while simultaneously reinforcing fundamental labor rights in digital contexts. The EU's Digital Education Action Plan¹⁴ provides a model for this balanced approach, requiring member states to develop comprehensive AI competency frameworks that integrate technical skills with human-centric capabilities. This policy instrument recognizes that technological mastery alone is insufficient true workforce readiness in the Fourth Industrial Revolution demands the strategic integration of STEM competencies with distinctly human strengths.

Looking forward, the most viable strategy for maintaining workforce relevance combines three critical elements: widespread technological fluency across all professions, deliberate cultivation of irreplaceably human skills, and policy environments that ensure these advantages are distributed equitably. This tripartite approach offers not just defense against displacement but active opportunities for human workers to thrive in complementary partnership with AI systems. As automation assumes increasingly routine cognitive and physical tasks, the human workforce's value will increasingly reside in capacities that machines cannot replicate: visionary innovation, complex judgment calls in ambiguous situations, and the cultivation of trust-based professional relationships¹⁵.

The challenge for policymakers, and business leaders is to architect systems that systematically develop these human advantages while ensuring the benefits of AI augmentation are broadly shared. Success in this endeavor will determine whether the AI revolution elevates human potential or exacerbates existing disparities in the 21st-century labor market.

In addition to the above, as workforce adaptation becomes imperative in the AI-driven economy, parallel efforts must focus on developing ethical artificial intelligence systems to

safeguard vulnerable populations against rights violations and discriminatory practices. Current legal frameworks, while addressing human bias, fail to adequately regulate algorithmic decision-making in employment contexts. Article L.1131-2 of the French Labour Code mandates non-discrimination training for recruitment personnel in establishments with 300+ employees at five-year intervals. However, this provision reveals a critical regulatory gap: it governs human recruiters but remains inapplicable to AI-driven recruitment tools, which may inadvertently institutionalize the biases of their developers. The 2019 French Digital Republic Act (Loi pour une République numérique)¹⁶ partially addresses this through algorithmic transparency requirements, yet lacks specific safeguards against AI-mediated discrimination in hiring. This legislative gap highlights the urgent necessity to implement binding ethical guidelines governing employment-related AI systems, establish mandatory bias audits for recruitment algorithms, and develop expanded interpretations of existing anti-discrimination statutes to encompass automated decision-making processes. While these measures find partial recognition in the EU's proposed AI Act, they require robust enforcement mechanisms at the national level to be truly effective. The French Digital Republic Act (LOI n° 2016-1321 du 7 octobre 2016)¹⁷ laid important groundwork through its algorithmic transparency provisions, yet falls short of specifically addressing AI-mediated discrimination in employment contexts - a deficiency that must be remedied through complementary legislation aligning with evolving EU standards.

In light of these considerations, the European Economic and Social Committee (EESC), in its Opinion INT/806 of 19 September 2018 entitled 'Artificial Intelligence: Anticipating its impact on labour to ensure a just transition,' explicitly advocated for the ethical deployment of artificial intelligence in employment contexts¹⁸. The Committee emphasized particular concerns regarding AI systems deployed for employee productivity assessment and recruitment processes, underscoring that such applications must strictly comply with fundamental rights protections, including: safeguarding worker data privacy under the General Data Protection Regulation (GDPR) (Regulation (EU) 2016/679); and ensuring full adherence to anti-discrimination principles enshrined in Directive 2000/78/EC establishing a general framework for equal treatment in employment. This position was subsequently reinforced by Professor Cédric Villani in his landmark report 'For a Meaningful Artificial Intelligence'¹⁹, which proposed the creation of a National Digital Technology and AI Ethics Committee. Professor Villani's recommendations included establishing this independent regulatory body with a mandate to: structure public discourse on AI ethics through formal consultation mechanisms; develop binding ethical guidelines for AI deployment in sensitive domains including employment; and interface with existing data protection authorities to ensure legal compliance²⁰. These complementary initiatives reflect growing institutional recognition that AI governance in the workplace requires both technical safeguards and robust ethical oversight mechanisms to prevent rights violations while harnessing technological progress.

1.2 Legal Challenges associated with the implementation of the labour contract

The integration of artificial intelligence in workplace operations presents a dual reality of measurable efficiencies and substantive organizational challenges. This dichotomy manifests most acutely in two critical dimensions: first, the fundamental restructuring required in strategic workforce planning to account for AI-driven operational models; second, the necessary adaptation of work organization principles to align with algorithmic systems while preserving employment standards. These transformative requirements create inherent tensions between technological optimization and traditional labor frameworks, necessitating careful policy development that reconciles productivity objectives with workforce stability imperatives. The legal landscape must consequently evolve to provide structured guidance for this transition, ensuring technological

adoption proceeds within defined parameters that safeguard both operational continuity and employee protections.

1.2.1 Future Labour Planning Mechanisms

The French labor law establishes a comprehensive regulatory framework that imposes affirmative obligations on employers to ensure continuous workforce adaptation, particularly in response to technological evolution²¹. At the core of this system lies Article L.6321-1, which mandates employers to implement structured training programs aimed at renewing and enhancing employees' professional and technological competencies, thereby guaranteeing their ability to adapt to evolving job requirements. This fundamental obligation is reinforced through mandatory consultations with the Social and Economic Committee (CSE) regarding strategic decisions affecting work organization and skills development, ensuring that technological implementation is accompanied by appropriate social dialogue²². Furthermore, Article L.6315-1 institutionalizes biannual professional development interviews focused exclusively on career progression and skills acquisition, creating a systematic approach to competency management while expressly prohibiting their use for performance evaluation purposes. Together, these provisions form an integrated legal structure that combines anticipatory skills development, institutionalized worker participation, and individualized career monitoring, thereby balancing enterprise flexibility with workforce security in the face of technological change. The regulatory approach emphasizes preventive measures through legally-enforceable upskilling mechanisms rather than post-displacement remedies, reflecting the French model of proactive labor market regulation designed to maintain employment stability amidst digital transformation.

Therefore, the employer is legally obligated to implement specific measures aimed at future workforce planning, particularly through the establishment of training programs, vocational courses, and upskilling initiatives designed to renew, deepen, and develop employees' general, professional, and technological competencies²³. This obligation underscores the employer's role in fostering continuous professional development in response to evolving economic and technological demands.

In this context, while French²⁴ and Algerian²⁵ labor legislation mandates consultation with employee representative bodies namely, the Social and Economic Committee (CSE) in France and the Joint Committee in Algeria on numerous labor-related matters, the qualification of job categories at risk due to economic and technological disruptions remains subject to optional negotiation rather than a compulsory requirement. Given the accelerating integration of artificial intelligence (AI) and automation into the workplace alongside the associated risks of workforce displacement this approach warrants legislative reconsideration. Specifically, the French legislator should reassess the necessity of elevating this subject to the status of a mandatory negotiation topic to better safeguard workers' interests amid rapid technological change.

This perspective aligns with the recommendations set forth in Cédric Villani's landmark report on artificial intelligence²⁶, which advocates for revising the scope of mandatory negotiation subjects to account for the transformative impact of emerging technologies²⁷. The report emphasizes the need to address both the challenges and opportunities presented by workplace digitization, ensuring a balanced framework that harmonizes human labor with technological advancements while mitigating adverse employment effects.

1.2.2 Reorganizing Work Within workplaces

Digital technology has fundamentally transformed the labor sector, most notably through its significant impact on the volume and scheduling of work. The widespread adoption of remote work arrangements, the increasing collaboration between human workers and automated systems, and the emergence of novel work methodologies have collectively necessitated a comprehensive reassessment of existing labor regulations. These technological advancements challenge traditional frameworks governing employment contracts, particularly in areas such as working hours, productivity monitoring, and the delineation of employer and employee obligations. Consequently, labor laws must evolve to address these paradigm shifts, ensuring that legal provisions remain aligned with contemporary workplace realities while safeguarding workers' rights in an increasingly digitalized economy.

On another level, the integration of artificial intelligence (AI) into the modern workforce has fundamentally altered the traditional worker-machine relationship, necessitating a paradigm shift in labor law, corporate governance, and workforce policy. Historically, machines functioned as tools passive instruments under the direct control of human workers, enhancing productivity without replacing human judgment. Today, however, AI systems increasingly operate autonomously, performing complex tasks such as legal analysis, medical diagnostics, and financial forecasting that were once the exclusive domain of skilled professionals.

This evolution from assistive tool to functional substitute raises critical legal and ethical questions. In sectors like legal services, AI-powered "Legaltech" platforms now independently draft contracts, predict litigation outcomes, and even provide client advisories tasks that traditionally required years of specialized human training²⁸. Similarly, in manufacturing, AI-driven robots no longer merely assist human workers but instead manage entire production lines with minimal oversight²⁹. These developments challenge existing labor frameworks, which were designed under the assumption that technology supplements, rather than supplants, human labor.

The implications extend beyond mere displacement. When AI assumes roles previously held by humans, it disrupts established employment structures³⁰, collective bargaining agreements, and even professional licensing systems. For instance, if an AI system can perform legal research with greater speed and accuracy than a junior attorney, how should labor laws adapt to protect jobs while encouraging innovation? Moreover, if AI begins making decisions with legal or financial consequences, who bears liability- the developer, the employer, or the AI itself?

Professor Cédric Villani's insights in his 2018 report, suggest that this shift should not be viewed solely as a threat but as an opportunity to redefine human labor. By automating routine and repetitive tasks, AI could free workers to focus on inherently human strengths- creativity, ethical reasoning, emotional intelligence, and complex problem-solving³¹. However, this optimistic vision requires proactive legal and institutional reforms. Legislators must reconsider:

Job reclassification: Should AI-managed roles fall under traditional employment law, or do they require new regulatory categories?

Liability frameworks: How should accountability be assigned when AI systems make errors in professional settings?

Reskilling obligations: To what extent must employers invest in retraining programs to transition workers into AI-resistant roles?

In essence, the transition from AI as a tool to AI as a substitute demands more than technological adaptation it requires a fundamental rethinking of labor rights, corporate responsibility, and economic policy in the age of automation.

Certainly, while robotic systems undeniably provide invaluable assistance in performing hazardous tasks sparing human workers from dangerous exposures such as toxic waste cleanup or extreme physical labor their widespread adoption raises profound concerns about the erosion of human agency in workplace decision-making³². The central paradox lies in the fact that as machines assume greater operational control, ostensibly to enhance safety and efficiency, they may simultaneously diminish workers' capacity for independent judgment and professional initiative. This phenomenon manifests through two interrelated mechanisms: first, through automation bias—the documented human tendency to uncritically favor machine-generated solutions and second, through the systematic delegation of decision-making authority to algorithmic systems³³. Professor Cédric Villani's research on human AI collaboration underscores this critical tension, warning that "under the pretense of optimizing work environments, excessive reliance on automated systems may gradually erode fundamental human competencies."³⁴ His observation reveals the dual edge nature of workplace automation: while robotic systems protect workers from immediate physical dangers, they risk creating a more insidious, cognitive vulnerability by displacing the very skills critical thinking, adaptive problem-solving, and creative judgment that remain most essential in an increasingly automated economy. This dynamic necessitates careful consideration in labor policy, particularly regarding how to preserve human oversight in safety critical industries while still harnessing the protective benefits of robotic assistance.

The legal implications are equally significant, as existing occupational health and safety frameworks were designed for human-centric workplaces, not hybrid environments where operational control is shared with or ceded to autonomous systems³⁵. Legislators must therefore address emerging questions: Should regulations mandate human override capabilities in safety-sensitive applications? How might liability regimes evolve when accidents occur in human-machine collaborative settings? And what training standards are required to maintain workforce competencies in an age of increasing automation? These challenges underscore the need for proactive legal and institutional innovation to ensure that the integration of robotic systems enhances rather than undermines both worker safety and professional autonomy³⁶.

Accordingly, the current situation, characterized by the pervasive integration of artificial intelligence systems across economic sectors, necessitates a fundamental restructuring of labor law frameworks that remain bound to antiquated conceptions of unified workplaces and fixed working schedules. This imperative emerges from three interrelated transformations reshaping the nature of work: the dissolution of physical workplace boundaries through remote and hybrid arrangements³⁷, the emergence of collaborative human-machine work models that transcend traditional employment relationships, and the need to regulate algorithmically-structured working conditions in the digital economy.

The existing legal architecture, designed for industrial-era work organization, proves increasingly inadequate to address these developments. Legislative reform must consequently pursue multiple objectives simultaneously: redefining core employment law concepts to accommodate location-independent and asynchronous work patterns; establishing clear liability frameworks for human-AI collaborative environments; and creating robust safeguards against digital surveillance while ensuring fair productivity measurement in algorithmically-managed workplaces³⁸. These adaptations must be implemented without compromising fundamental worker protections or social safety nets.

This regulatory modernization should draw guidance from two foundational principles: technological neutrality to ensure lasting relevance amid continued innovation, and human-centric design to preserve worker autonomy in increasingly automated environments³⁹. As evidenced by progressive instruments like the EU's Artificial Intelligence Act⁴⁰ and OECD AI Principles⁴¹, effective reform requires specific provisions guaranteeing human oversight of AI decision-making processes, mandating transparency for workplace algorithms, and setting critical thresholds for

human intervention in safety-sensitive operations. The ultimate objective remains the creation of a responsive legal ecosystem capable of both fostering technological advancement and protecting worker dignity in this era of unprecedented digital transformation.

2. Liability Arising from the Deployment of Artificial Intelligence in Workplace

The transformative impact of artificial intelligence (AI) systems on employment conditions and associated legal relationships is undeniable, irrespective of whether such effects are perceived as beneficial or detrimental. Yet, the existing legal framework has failed to evolve commensurately with the rapid advancements in AI technology. This regulatory lag has engendered significant ambiguity in the domain of civil liability, as traditional legal doctrines remain ill-equipped to address the novel challenges posed by AI systems—particularly in determining the appropriate legal basis for liability (e.g., fault-based liability, strict liability, or no-fault schemes). Consequently, this legislative vacuum has necessitated doctrinal intervention, prompting legal scholars to propose two primary theoretical constructs for establishing liability in this context

2.1 Employer Liability Arising from Workplace Artificial Intelligence Applications

Prior to engaging in theoretical conjectures, it must be established that prevailing legal frameworks predominantly classify artificial intelligence systems as 'things' - or more specifically, as 'intangible property' under existing jurisprudence. This conventional categorization persists despite emerging scholarly discourse advocating for the recognition of autonomous legal personality for AI entities, distinct from the natural or juridical persons who employ them. The doctrinal tension between these competing conceptualizations raises fundamental questions about the adequacy of traditional property law paradigms to address the unique characteristics of advanced AI systems, particularly their capacity for autonomous decision-making and potential liability implications.

2.1.1 Doctrinal Approaches to Employer Responsibility for AI System Consequences

Within the prevailing legislative vacuum concerning artificial intelligence liability, a discernible jurisprudential trend across major common law and civil law jurisdictions has emerged, imposing strict liability on employers for damages caused by employees' operational use of AI decision-support systems. This developing jurisprudence - particularly evident in recent English Court of Appeal decisions⁴² establishes three key doctrinal principles: (a) the employer's non-delegable duty to ensure safe system operations; (b) the characterization of AI tools as modern workplace instruments falling within the employer's sphere of control; and (c) the recognition that employment subordination inherently negates the autonomous decision-making capacity required for guardian liability under traditional tort principles.

The theoretical underpinnings of this approach draw significantly from risk-allocation theory and enterprise liability models, wherein the employer, as primary beneficiary of AI system outputs, assumes liability as an inherent cost of business operations. Comparative analysis reveals this mirrors the German doctrine of Betriebsrisikolehre (§ 278 BGB)⁴³ while diverging from more restrictive American approaches that still require demonstration of employer negligence in most jurisdictions⁴⁴. This emerging paradigm fundamentally reconceptualizes the Roman law-derived principle of respondeat superior for the algorithmic age, recognizing that the employer's superior capacity to absorb and distribute AI-related risks justifies strict liability regardless of the employee's technical interaction with the system.

At the level of French civil liability jurisprudence, when harm results from an employee's use of an artificial intelligence system, the victim's claim for compensation cannot be grounded in the employer's vicarious liability for subordinate actions (*responsabilité du fait d'autrui*), but rather must be established under Article 1242-1 of the French Civil Code and its Algerian counterpart in Article 138⁴⁵ - that is, through the employer's liability as guardian (*gardien*) of the AI system that caused

the damage. This doctrinal approach, however, presents two fundamental legal challenges that must be resolved prior to establishing liability: First, the determination of guardianship requires conclusive evidence that the employer exercised actual control (usage, direction, et contrôle) over the AI system. While ownership may create a rebuttable presumption of guardianship, the unique nature of AI systems complicates this analysis⁴⁶. These systems possess a dual aspect - structure (original programming) and behavior (data-driven outputs) - which may be subject to divided guardianship. The employer may qualify as guardian of the system's operational behavior, while the designer retains guardianship over its structural programming. This division raises complex evidentiary questions regarding whether the harmful decision originated from the system's foundational architecture or emerged through subsequent training data and workplace implementation.

Second, the application of liability for the acts of things (*responsabilité du fait des choses*) to intangible AI systems confronts significant doctrinal obstacles under traditional civil law principles. While embodied AI systems (such as industrial robots) clearly fall within existing liability frameworks, most AI applications exist as intangible algorithms lacking physical manifestation⁴⁷. This juridical gap has prompted influential legal scholars, including Professors Grimaldi and Terré, to advocate for the extension of Article 1242-1 to encompass intangible objects. Their arguments emphasize the necessity of maintaining effective compensation mechanisms in an increasingly algorithmic society, warning against the emergence of liability voids where sophisticated AI systems cause harm without legal recourse.

Conversely, a significant doctrinal perspective maintains that the absence of strict liability regimes for AI systems would precipitate a problematic reversion to fault-based liability frameworks. This approach presents substantial evidentiary challenges, as victims face formidable obstacles in proving negligence due to the inherent complexity and opacity of algorithmic decision-making processes. Establishing fault in such cases would necessitate comprehensive data tracing to reconstruct the AI system's decision pathway, alongside technical forensic analysis to determine whether the harmful outcome stemmed from training data biases, algorithmic design flaws, or implementation failures. Crucially, it would also require precise attribution of responsibility among multiple potential actors whether developers, trainers, or end-users a task complicated by the distributed nature of AI development and deployment⁴⁸.

This fault-based paradigm raises critical concerns about access to justice, as it effectively shifts the burden of proof to plaintiffs who may lack the technical resources to deconstruct proprietary AI systems⁴⁹. The requirement to demonstrate specific failures in design, training, or deployment particularly when such systems operate as 'black boxes'. Moreover, harms may emerge from complex interactions between original programming, adaptive learning, and operational environments, rendering it extraordinarily difficult to isolate discrete fault elements under conventional tort principles⁵⁰. Such challenges underscore the inadequacy of fault-based models in addressing AI-induced harms, where causality is often nonlinear and accountability diffuse.

2.1.2 Assigning Liability to Artificial Intelligence

The injured party faces significant legal hurdles in attributing liability to employers for harm caused by artificial intelligence (AI) systems, primarily because existing law firmly denies AI systems recognition as legal persons. This doctrinal position persists even as some scholars argue that highly autonomous AI systems, capable of independent decision-making and learning, may warrant a reevaluation of traditional legal personhood criteria. Proponents of this view⁵¹ contend that sufficiently advanced AI could theoretically bear rights and obligations, akin to corporations or other non-human entities granted legal personality. Others, however, reject this analogy, emphasizing that AI lacks consciousness, intentionality, or the capacity to participate in legal relations⁵².

Despite this unresolved debate, the prevailing legal framework treats AI systems as mere tools or instruments under human control. Consequently, the most pragmatic approach to securing redress for victims is to anchor liability within the employer's sphere of responsibility. By subsuming AI systems under the employer's de facto authority-similar to the dependency link governing employee liability- the application of Article 1242 Paragraph 05 Or even on the basis of the general legal rules relating to third-party liability referred to in Article 1242 paragraph 01 of French Civil Code becomes both logically and legally justifiable. The employer's control over the AI's design, deployment, and operational parameters (even if the system exhibits technical autonomy) functionally mirrors the supervision required for employee liability. This reasoning sidesteps the intractable question of AI personhood while ensuring accountability aligns with existing legal principles⁵³.

Critically, this approach does not require reclassifying AI as a legal person but instead extends the employer's duty of oversight to encompass AI-related risks. Such an interpretation finds support in comparative law: the EU's AI Liability Directive⁵⁴ increasingly emphasize strict liability for enterprises deploying opaque or high-risk AI systems. Thus, doctrinal consistency is preserved-AI remains a non-person-while adapting liability mechanisms to technological realities.

Beyond the aforementioned considerations, granting legal personality to artificial intelligence systems would introduce an additional liable party-the AI system itself- into compensation claims. This scenario presents unique complications, as AI systems would not qualify for the liability protections established in jurisprudence such as the Costedoat judgment⁵⁵. Unlike human employees, AI systems lack the capacity to benefit from such liability limitations, as they possess neither legal subjectivity nor personal interests that could justify mitigated responsibility.

Moreover, imposing liability directly on AI systems would prove functionally meaningless without implementing complementary financial safeguards. Given that AI entities lack assets or the capacity to satisfy judgments, any meaningful recognition of their liability must be predicated on mandatory financial provisioning by their designers or operators. This could take the form of upfront capital endowments, guarantee funds, or specialized insurance policies mechanisms that would ensure adequate compensation pools for potential victims⁵⁶. The absence of such financial backing would render AI liability purely theoretical, as injured parties would have no practical means of recovery.

2.2. Safeguarding Workers from AI-System-Induced Damages

The adoption of AI systems in workplaces enhances safety while introducing new risks that challenge traditional liability frameworks⁵⁷. While labor law protects workers through employer duties of care, AI-related harms may necessitate extending liability to system producers. Existing doctrines of employer responsibility and product liability must adapt to ensure fair compensation in the age of workplace AI. A balanced approach distributing accountability across employers and manufacturers could promote both innovation and worker protection.

2.2.1 Employer Liability for Occupational Safety Concerning Artificial Intelligence Applications in the Workplace

Artificial intelligence systems present significant potential for enhancing occupational safety and security through various applications, including robotic automation of hazardous tasks and decision-support algorithms designed to minimize human error. Notwithstanding these benefits, the integration of AI technologies into the workplace introduces novel risks that merit careful legal consideration. The degree of risk exposure appears directly proportional to the level of human-system interaction, with particularly acute hazards emerging when these systems take physical form as industrial robots⁵⁸.

Moreover, the integration of artificial intelligence systems into the workplace introduces inherent risks that manifest through two primary channels⁵⁹. First, operational hazards arise from the complexities of human-machine interaction, where miscommunication, improper use, or unforeseen behavioral responses in AI-driven systems can lead to workplace accidents. Second, systemic risks stem from underlying programming deficiencies, algorithmic biases, or design flaws embedded within the AI technology itself⁶⁰. These vulnerabilities- whether emerging from real-time operational failures or inherent technical shortcomings- pose significant threats to worker safety, potentially resulting in immediate physical injuries or contributing to long-term occupational illnesses⁶¹.

From a physical safety perspective, AI implementation introduces unexpected hazards. Robotic exoskeletons designed to assist with movement or rehabilitation carry inherent risks - a malfunction could directly injure the worker using the device⁶². Similarly, AI-powered robots performing labor tasks may create unfamiliar dangers in work environments, particularly when communication failures occur between automated systems and human workers⁶³. Even digital AI systems managing workflow can indirectly cause harm by creating unrealistic productivity demands that pressure workers into unsafe practices⁶⁴.

The psychological impacts of workplace AI may be even more concerning. Constant algorithmic monitoring creates an atmosphere of pervasive surveillance, leading to increased stress and anxiety among employees. Many workers report feeling compelled to extend working hours or skip necessary breaks due to automated performance tracking. Remote employees face particular challenges as AI-enabled monitoring tools erase traditional boundaries between professional and personal life⁶⁵.

Such risks do not exist in isolation but rather interact with existing legal frameworks governing workplace safety⁶⁶. Employers remain bound by statutory and common-law obligations to provide a safe working environment, regardless of whether harm originates from human error, mechanical failure, or AI system malfunctions. Consequently, when AI-related incidents occur, they engage established principles of employer liability under occupational health and safety regulations. This legal responsibility persists even as technology evolves, requiring employers to continuously assess and mitigate new forms of risk introduced by advanced automation⁶⁷.

The challenge for legal systems lies in determining whether traditional liability structures- developed for human and industrial machine risks- can adequately address the unique characteristics of AI-induced harm⁶⁸. Unlike conventional machinery, AI systems operate with varying degrees of autonomy, learning from data inputs and adapting behaviors in ways that may not always be predictable⁶⁹. This raises critical questions about fault attribution: Should liability rest solely with the employer for failing to ensure safe implementation, or should it extend to AI developers when systemic flaws cause harm? Legal frameworks must evolve to clarify these boundaries while maintaining robust protections for workers.

The French legal system addresses these concerns through Article L. 4121-1 of the Labour Code, which imposes a strict obligation on employers to implement all necessary measures to safeguard both the physical and psychological well-being of workers. This statutory duty has received authoritative interpretation from the Cour de Cassation, which has established in its jurisprudence that an employer may discharge this obligation by demonstrating full compliance with the preventive measures enumerated in Articles L. 4121-1 and L. 4121-2⁷⁰. This judicial position creates a safe harbor for employers who can evidence comprehensive implementation of mandated safety protocols, while simultaneously maintaining rigorous standards for workplace protection.

The evolving nature of AI-related risks suggests that traditional safety frameworks may require adaptation to address the unique challenges posed by autonomous systems⁷¹. This

necessitates ongoing evaluation of whether existing legal mechanisms sufficiently account for the distinctive characteristics of AI-induced workplace hazards, particularly those stemming from algorithmic decision-making processes and machine learning unpredictability.

2.2.2 Holding AI Producers Liable for System Defects

When a worker suffers harm caused by an artificial intelligence system in the workplace and cannot obtain adequate compensation through employer liability channels, an alternative legal pathway exists through product liability claims against the AI system's designer or producer. In the current absence of specialized liability frameworks governing AI systems, injured workers may invoke traditional product liability mechanisms established under Article 1245 of the French Civil Code and the EU Product Liability Directive⁷² subject to some adjustments⁷³. These legal instruments impose strict liability on product manufacturers for damages caused by defective products, regardless of whether a contractual relationship exists between the injured party and the producer.

The application of product liability principles to AI systems presents several complex legal challenges that require careful consideration. First and foremost is the fundamental question of classification: can AI systems, particularly those without physical embodiment "dematerialized AI", properly be considered "products" under existing legal definitions? While AI integrated into physical devices (such as industrial robots or autonomous vehicles) clearly falls within traditional product categories, purely software-based AI systems occupy a legal gray area⁷⁴. Some legal scholars argue by analogy to professional services⁷⁵, while others point to the admission of institutions of the European Communities in 1989 and the French government in 1998 that software could correspond to the product covered by the EU Product Liability Directive.

Furthermore, the traditional product liability framework requires substantial adaptation to address AI-specific characteristics. The concept of a "defect" in product liability law traditionally concerns physical safety expectations⁷⁶, but AI systems may cause harm through entirely different mechanisms, such as algorithmic bias leading to discriminatory outcomes or flawed decision-making processes. This necessitates rethinking both the standards for defectiveness and the methods for proving such defects in AI systems.

Moreover, the notion of "producer" under Article 1245-5 of the French Civil Code⁷⁷ and the article 140 bis of algerian Civil Code warrants reconsideration. Given that the current definition encompasses only the "manufacturer of finished products, raw materials, or component parts" this raises critical questions about whether AI developers, programmers, and service providers involved in the creation of AI systems could be held liable. Consequently, the European Parliament should address this gap by revising and expanding the legal definition of "producer" to account for these stakeholders.⁷⁸

Additionally, the development risk-defense⁷⁹, which allows producers to avoid liability for defects that were scientifically undetectable at the time of product release, may create inappropriate immunity for AI system developers given the rapid pace of technological advancement in this field.

These challenges highlight the need for legislative reform to modernize product liability regimes for the AI age, while maintaining the important protections these frameworks offer to injured parties. Until such reforms are implemented, courts will need to apply creative interpretations of existing laws to ensure adequate remedies for those harmed by AI systems in the workplace.

Conclusion :

In summary, the profound transformations instigated by artificial intelligence (AI) systems in the organization, management, and execution of work demand urgent and systematic legal

consideration. As AI increasingly influences workforce restructuring, including layoffs and unemployment dynamics, the resultant legal, ethical, social, and economic ramifications necessitate a coordinated legal response. While the trajectory of AI adoption remains dynamic and inherently uncertain, its proliferation is inexorable, propelled by exponential advances in machine learning, automation, and data analytics. This paradigm shift compels a comprehensive reassessment of extant legal frameworks predominantly developed for pre-digital labor environments to address the novel complexities posed by AI. The inherent tension between technological innovation and regulatory oversight is evident: AI's capacity to enhance productivity and generate economic opportunities is counterbalanced by systemic risks to labor rights, accountability vacuums, and entrenched inequalities.

The interplay between law and technology is neither linear nor unidirectional in nature. Whereas some posit that legal systems must evolve reactively to accommodate technological progress, others contend that juridical principles ought to proactively govern technological development to safeguard fundamental societal interests. Within the AI context, this dialectic assumes critical significance. Existing legal frameworks governing labor relations, civil liability, and occupational safety were not designed to account for the autonomous, adaptive, and often opaque nature of AI systems. Such legislative lacunae engender regulatory gaps, exposing both workers and employers to unanticipated risks. For instance, AI's capacity to operate independently of direct human intervention challenges conventional liability paradigms, while its reliance on vast datasets intensifies concerns regarding privacy infringements, algorithmic bias, and discriminatory outcomes. Even in some countries that have a robust labor protections- as France-, the absence of AI-specific statutory provisions leaves workers vulnerable to exploitative practices rooted in algorithmic opacity or unjustified workforce reductions masquerading as economic necessity.

accordingly, based on the analytical approach adopted by the study, which investigated the limits of the ability of current legal frameworks to protect workers' rights in the face of the adoption of artificial intelligence systems within the workplace, some key results we can draw:

- Traditional labor laws are ill-suited for AI-driven work environments, as fixed schedules and designated work locations conflict with the flexibility AI enables.

- AI adoption in the workplace poses employment risks, with employers potentially using economic dismissal provisions to justify layoffs, despite legal safeguards meant to protect workers.

- AI integration in physical work environments introduces new health and safety risks, including stress from constant monitoring and potential injuries from malfunctioning autonomous systems. Existing occupational safety regulations do not adequately address these AI-specific hazards.

- AI adoption widens the skills gap and leads to workforce displacement, as it increases demand for technical expertise while making some roles obsolete. Neither country has established legal mandates for employer-funded reskilling programs or income support for affected workers, exacerbating economic inequalities.

- The automation of managerial tasks through AI weakens traditional worker consultation and collective bargaining processes. Labor laws in Algeria and France do not require employers to negotiate AI implementation with unions or worker representatives, reducing transparency and worker agency.

- The Current civil liability rules are insufficient for addressing AI-related harms, as existing regulations fail to establish clear accountability for AI systems.

- Despite the EU's emphasis on ethical AI governance, Algeria and France lack binding legal standards to ensure AI systems adhere to principles like fairness, transparency, and human

oversight. This regulatory gap allows efficiency to take precedence over ethical considerations, potentially harming worker rights and autonomy.

Based on the previous results, the research paper proposes the following recommendations:

- Modernize legal frameworks by revising employer obligations to include AI-specific safety and risk mitigation protocols.
- Update civil liability rules to address the intangible nature of AI and ensure accountability for system errors or damages.
- Align labor laws with the reality of AI, redefining working hours and methods to reflect hybrid human-machine collaboration.
- Enhance worker protections by requiring employers and workers' committees to conduct periodic negotiations to assess the impact of AI integration on jobs, skills, and workloads, and tighten oversight of AI-related economic dismissals to prevent abuse.
- Improve worker training and reskilling programs by launching mandatory, employer-funded reskilling initiatives to support workers who have lost their jobs due to AI-driven automation.
- Develop public-private partnerships to develop AI literacy programs that equip workers with relevant technical skills, and provide financial incentives (such as tax breaks and subsidies) for companies that invest in workforce retraining efforts.
- Enhance occupational safety measures by developing AI-specific workplace safety guidelines to address the risks posed by autonomous machines and algorithmic surveillance, and require companies to conduct psychological impact assessments of AI-driven surveillance practices to mitigate stress-related risks.
- Improve worker training and reskilling programs by launching mandatory employer-funded reskilling initiatives to support workers displaced by AI-driven automation, establishing public-private partnerships to develop AI literacy programs that equip workers with relevant technical skills, and providing financial incentives (such as tax breaks and subsidies) for companies that invest in workforce retraining efforts.
- Require AI developers to obtain financial insurance to cover potential damages caused by their systems.
- Follow the EU approach by building on the EU's leading AI regulations by adopting tailored and enforceable standards, while addressing transparency and accountability gaps

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