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The Legal Protection of Artificial Intelligence Generated Works In the Absence of a Human Author

الحماية القانونية لمصنّفات الذكاء الاصطناعي في ظلّ غياب المؤلف البشري

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Abstract:

This study examines the challenges posed by artificial intelligence (AI) to traditional intellectual property (IP) frameworks, particularly in cases where creative or innovative outputs are generated without direct human authorship. As AI systems become increasingly capable of autonomous learning and content creation, they challenge the foundational legal assumption that authorship - and by extension, IP protection - is inherently human. The research critically explores whether existing IP laws can accommodate AI-generated works, the feasibility of recognizing AI as a legal subject, and the implications of attributing authorship or liability in such cases. Drawing on comparative legal analysis from civil law, common law, and selected Arab jurisdictions, the study highlights the inconsistencies and gaps in current legal systems. It advocates for the development of a specialized legal framework that reflects the realities of the digital age, including redefined standards of "innovation" and the implementation of the "responsible human proxy" doctrine. Ultimately, the study calls for a shift in legal philosophy - one that balances the need for legal certainty with the dynamic nature of technological advancement in the field of intellectual property.

Keywords: Artificial Intelligence, Intellectual Property, Digital Transformation, AI-generated Works, Innovation.

الملخص:

يتناول هذا البحث التحدّيات التي يفرضها الذكاء الاصطناعي على الأطر التقليدية للملكية الفكرية، لا سيما في الحالات التي يتم فيها إنتاج مصنفات إبداعية أو ابتكارية دون وجود مؤلف بشري مباشر. ومع ازدياد قدرة أنظمة الذكاء الاصطناعي على التعلم الذاتي وإنشاء المحتوى بشكل مستقل، أصبحت هذه الأنظمة تشكّل تحديًا للفرضية القانونية الأساسية التي تفترض أن صفة المؤلف – وبالتالي الحماية القانونية – تقتصر على الكائن البشري. يبحث هذا البحث بشكل نقدي في مدى قدرة القوانين الحالية للملكية الفكرية على استيعاب المصنفات الناتجة عن الذكاء الاصطناعي، وإمكانية الاعتراف بالذكاء الاصطناعي ككيان قانوني، وانعكاسات ذلك على نسب التأليف وتحميل المسؤولية القانونية. ومن خلال تحليل قانوني مقارن يشمل الأنظمة القانونية المدنية، والأنجلوسكسونية، وبعض التشريعات العربية المختارة، يسلّط البحث الضوء على أوجه القصور والتباين في النظم القانونية القائمة. ويدعو إلى تطوير إطارٍ قانونيٍّ خاصٍّ يعكس واقع العصر الرقمي، ويتضمن إعادة تعريف لمفهوم "الابتكار" وتطبيق مبدأ "الوكيل البشري المسؤول". وفي النهاية يدعو البحث إلى تحول في الفلسفة القانونية، يوازن بين الحاجة إلى اليقين القانوني والطبيعة المتغيرة والمتسارعة للتقدم التكنولوجي في مجال الملكية الفكرية.

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الكلمات المفتاحية: الذكاء الاصطناعي، الملكية الفكرية، التحول الرقمي، المصنفات الناتجة عن الذكاء الاصطناعي، الابتكار.

Introduction

In recent decades, contemporary societies have undergone profound transformations driven by the rapid development of information and communication technologies. These transformations have generated new patterns of human behavior and reshaped traditional concepts of work, production, innovation, and social interaction. At the forefront of these advanced technologies lies Artificial Intelligence (AI), which has become a cornerstone of the digital economy and a central driver of ongoing changes across various sectors, including healthcare, industry, education, financial services, and even creative, literary, and artistic fields[1].

AI technologies have evolved from simple tools based on linear programming into systems capable of self-learning, analysis, decision-making, and innovation within their own cognitive frameworks. This development calls for a reconsideration of the nature of the relationship between humans and machines on the one hand, and between law and technology on the other[2]. In the past, machines were mere passive instruments under human control. Today, however, certain AI applications are capable of generating unpredictable content that often exhibits a level of creativity making it difficult to distinguish between human and machine-generated outputs[3].

In parallel with this technological evolution, intellectual property (IP) rights emerge as one of the most affected legal domains, being intrinsically linked to creativity, innovation, and individual authorship. The legal frameworks governing copyright, patents, and industrial designs are traditionally based on the fundamental assumption that the creator is a human being, and that the protected work is the product of original and personal intellectual effort[4]. This assumption, however, is now subject to necessary reconsideration, especially given the capacity of AI to generate works that may satisfy traditional legal standards of protection - such as coherence, novelty, and utility - without any direct human intervention from the programmer or the user[5].

Historically, the foundations of intellectual property systems are rooted in distinct legal philosophies. The civil law tradition emphasizes the personal connection between the author and the work, focusing on the moral dimension of authorship, whereas the common law tradition prioritizes the practical and economic value of the work[6]. In the context of digital transformation, these systems are increasingly tested - particularly when dealing with works autonomously created by AI without any clear personal imprint attributable to a human author.

This challenge becomes even more complex in light of the multiple actors involved in the creation of AI systems, including programmers, developers, users, algorithm owners, and system manufacturers. Who, then, is the legal author? Who holds the rights? And can AI be granted independent legal personality under legal theory, enabling it to

[1] Russell, S., & Norvig, P, Artificial Intelligence: A Modern Approach (4th ed.), Pearson, 2020, p 102.

[2] Kumar, S., Singh, M., & Gupta, A., Artificial Intelligence and Intellectual Property Rights: Challenges and the Way Forward. Journal of Intellectual Property Rights, 26(2) 2021, p 89.

[3] Gervais, D, AI and Copyright: Charting a Path Forward, Houston Law Review, 59(3), 2022, p 533.

[4] Ginsburg, J. C., & Budiardjo, L, Authors and Machines. Columbia Journal of Law & the Arts, 42(3), 2019, p 400.

[5] Samuelson, P, Allocating Ownership Rights in Computer-Generated Works, University of Pittsburgh Law Review, 81(2),2020, p 250.

[6] Goldman, E, IP and Machines: Ownership and Authorship, In Research Handbook on the Law of Artificial Intelligence, Edward Elgar Publishing, 2018, p 260.

enjoy legal protection or be held liable for its creations? These fundamental questions are not only of concern to legislators but also lie at the heart of the evolving relationship between law and technology. They represent a pivotal point in redefining the concepts of legal protection in the digital age[1].

Accordingly, the central problem addressed in this research may be formulated as follows:

To what extent is the traditional legal framework of intellectual property capable of accommodating the outcomes generated by artificial intelligence, particularly in terms of recognizing AI as an "author" or protecting its outputs, in the absence of an independent legal personality?

- This overarching issue gives rise to several subsidiary questions, including:
- What is the legal basis for determining authorship or inventorship in cases involving the intervention of artificial intelligence?
- Can AI-generated outputs be considered "innovative" within the legal meaning that warrants copyright or patent protection?
- Who bears legal responsibility in cases where artificial intelligence infringes upon the intellectual property rights of others?
- Is it possible - or even necessary - to recognize artificial intelligence as possessing an electronic legal personality, enabling it to acquire rights and bear obligations?

The importance of this research lies in its focus on a novel and technically complex legal issue, which presents a significant legislative challenge for states and international institutions. This is particularly pressing in an era where technological innovations are advancing rapidly, often outpacing the development of clear legal provisions. The study aims to contribute to a more comprehensive legal understanding of AI's position within the intellectual property protection framework and to promote the development of flexible and integrated legislative models that align with the demands of the digital revolution.

In terms of methodology, the research adopts a comparative analytical approach by examining legal texts, judicial precedents, and scholarly opinions across several legal systems - including the French civil law system, the Anglo-American common law system, and selected Arab jurisdictions. The goal is to assess the adequacy of traditional frameworks and to explore possibilities for reforming or replacing them with models more suited to the evolving digital environment.

Through this analysis, the research seeks to enrich academic discourse on the interaction between technology and law, by critically reviewing the evolution of traditional legal concepts in light of artificial intelligence, and by proposing a more flexible and effective legal framework for the protection of intellectual property rights in the digital age.

1. Exploring the Legal Nexus between Artificial Intelligence and Intellectual Property:

The legal relationship between artificial intelligence (A+20I) and intellectual property (IP) unfolds across two fundamental dimensions. The first involves the intangible, abstract nature of AI's capacity to produce intellectual or creative content. The second pertains to the physical and technological embodiment of AI systems and tools.

These two dimensions trigger distinct legal concerns, particularly within the field of intellectual property law. As AI continues to evolve, questions surrounding the classification, attribution, and protection of AI-generated innovations become increasingly complex and demand nuanced legal responses.

1.1 The Influence of Artificial Intelligence on Intellectual Property Law:

Intellectual property law represents a multifaceted field that safeguards both creative and industrial achievements linked to legal entities. On one hand, it covers literary and

[1] Calo, R, Robotics and the lessons of cyberlaw, California Law Review, 103(3), 2016, p 540.

artistic works through copyright and related rights; on the other, it protects commercial and industrial inventions, such as patents, trademarks, industrial models, and geographic designations[1].

The integration of artificial intelligence into modern technological ecosystems has given rise to a new layer of legal challenges within this framework. Core issues have emerged around how to define and protect intellectual property generated or influenced by AI systems, and whether existing IP laws can sufficiently accommodate these developments[2].

n-depth legal analysis is essential to discern which IP rights are uniquely tied to AI innovations, and how these intersect - or potentially conflict - with traditional forms of intellectual property[3]. As AI continues to blur the boundaries between human and machine-generated creation, the legal community is increasingly engaged in re-evaluating the normative basis for IP protection in this rapidly evolving context[4].

1.1.1 The Convergence of Artificial Intelligence and Conventional Intellectual Property Structures:

This section explores the legal and conceptual complexities introduced by intellectual developments stemming from artificial intelligence systems and software. AI technologies function primarily by processing massive datasets - commonly referred to as big data"-[5] through sophisticated algorithmic structures. These algorithms, grounded in mathematics, computer science, and engineering[6] , are embedded in advanced digital systems that enable both shallow and deep learning, empowering machines to interpret information and produce responses with minimal human intervention[7].

Against this technological backdrop, contemporary legal regimes - such as those in France-[8] extend intellectual property protections to innovations tied to AI technologies. These safeguards apply across a spectrum of IP categories, including copyrights, patents, trademarks, industrial design rights, and geographical indications[9]. The legal process entails two essential aspects: the legal acknowledgment of an intellectual property right, and the mechanisms established for its enforcement. Even within the digital domain, these legal constructs are recognized and upheld. French legislation, in particular, ensures that original contributions - whether by natural individuals or legal entities - are

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[1] World Intellectual Property Organization, WIPO technology trends 2023: Artificial intelligence,2023, p 12.

[2] Gervais, D. J, AI and copyright: Charting a path forward. Columbia Journal of Law & the Arts, 44(3), 2021, p 420.

[3] Samuelson, P., Allocating authorship rights in AI-generated works, Journal of the Copyright Society, vol. 69, no. 4, 2022, p. 380

[4] Jean Larrieu, Robot and Intellectual Property, Dalloz, Paris, 2016, p. 291. - Jean Larrieu, Robots and Intellectual Property, in Propriété industrielle, No. 2, French National Institute of Industrial Property (INPI), Paris, February 2013. - Alain Bensoussan and Judith Bensoussan, Law of Robots, 1st ed., Larcier, Brussels, 2015, p. 63.

[5] Pierre Delort, Big Data, 2nd ed., Presses Universitaires de France (Que sais-je ? collection), Paris, 2018, p. 17.

[6] Frédéric Humbert, Big Data: The New Raw Material of the Company, Alongside Capital and Labor, in Le Nouvel Économiste, no. 1600, Supplement no. 2, 16–22 February 2012, p. 67.

[7] Biddle, S., Suresh, H., & Venkatasubramanian, On the foundations of algorithmic fairness. Communications of the ACM, 63(1), 2020, p 135.

[8] Code de la propriété intellectuelle (version consolidée au 15 Octobre 2019)

[9] European Parliament, Artificial intelligence and intellectual property: Challenges and potential reforms, Policy Department for Citizens' Rights and Constitutional Affairs, 2022, p. 18.

afforded appropriate protection[1], Typically, copyrights are granted to human creators, while other IP categories may vest in corporate or institutional inventors. This legal view has been reinforced in numerous rulings by French courts.

introduces new legal tensions. A major issue arises from the differing durations of protection granted to various types of intellectual property. Whereas such disparities were manageable in the pre-AI era, they have become problematic in today's integrated AI systems - especially in the robotics sector - where a single product may contain multiple components protected under separate legal regimes with conflicting timelines. For example, while copyright generally lasts for the lifetime of the author plus 50 years posthumously, trademarks and geographical indications are renewable every 10 years, and industrial designs typically expire after 5 years[2]. As a result, certain components may enter the public domain while others remain protected, exposing parts of the AI system to legal uncertainty. This inconsistency underlines the necessity for a harmonized legislative approach tailored to AI-related inventions, possibly through unified legal standards or synchronized protection periods[3].

Another pressing legal issue involves the allocation of IP rights in employer-employee relationships. Questions persist as to whether current legal frameworks adequately regulate ownership of AI-related innovations developed in the workplace[4], In some jurisdictions, specific rights transfer automatically to the employer by law, while others necessitate explicit contractual provisions. This legal ambiguity often leads to disputes over authorship and ownership of AI-generated content or inventions[5]. Consequently, there is an increasing demand for targeted legislative reforms to ensure clarity, fairness, and efficiency in managing IP rights within the context of AI development and deployment[6].

1.1.2 The Evolving Interface Between Artificial Intelligence and Contemporary Intellectual Property Regimes:

This section examines a unique dimension of intellectual creation: instances where artificial intelligence independently generates content, devoid of any direct or indirect human input or influence. Unlike traditional creative acts, which typically involve a human author or inventor, AI-driven outputs challenge conventional frameworks by operating autonomously[7]. Given that intellectual property is fundamentally rooted in the capacity for conceptual and creative reasoning - traits that AI can increasingly replicate across literary, industrial, and technological spheres - it becomes essential to assess whether such

[1] Code de la propriété intellectuelle. Article L. 111-1

[2] World Intellectual Property Organization, WIPO Technology Trends 2023: Artificial Intelligence, 2023, p. 24

[3]Court of Appeal of Paris, Chamber 4, Section A, 3 May 2006, no. 05/01400: Juris-Data no. 2006-322270.- Court of Cassation (Plenary Assembly), 7 March 1986, no. 83-10477.- Court of Cassation (First Civil Chamber), 17 October 2013, no. 11-21641.

[4] Code de la propriété intellectuelle. Article L. 111-1

[5] McDonagh, L., Artificial intelligence and IP law: Challenges and opportunities, Queen Mary Journal of Intellectual Property, vol. 10, no. 4, 2020, , p. 512.

[6] European Parliament, Artificial intelligence and intellectual property: Challenges and potential reforms, Policy Department for Citizens' Rights and Constitutional Affairs, 2022, p. 7.

[7] Elgammal, A., Liu, B., Elhoseiny, M., & Mazzone, M., CAN: Creative adversarial networks, generating 'art' by learning about styles and deviating from style norms, Proceedings of the 8th International Conference on Computational Creativity, 2017, pp. 75.- Calo, R., Artificial intelligence policy: A primer and roadmap, UC Davis Law Review, vol. 51, no. 2, 2020, p 190.

non-human agents merit independent rights over their innovations[1].

This inquiry becomes even more pertinent in light of advancements in machine learning, especially deep learning, which have enabled AI systems to produce works in journalism, visual arts, literature, and more[2]. As legal systems begin to cautiously recognize AI's role in producing literary content, the natural progression may involve extending similar considerations to technical and commercial outputs, including industrial design and product development.

Another equally pressing concern involves potential violations by AI of existing intellectual property rights. Once AI reaches a threshold of autonomous creativity, it may inadvertently or systematically infringe on the protected works of others, necessitating legal mechanisms to safeguard third-party rights in such circumstances[3].

Such a trajectory raises important legal dilemmas. Chief among them is how to define a legal framework that adequately addresses the status of these AI-originated creations and determines the rightful beneficiaries of any associated intellectual property rights. Equally significant is the question of how to respond when AI unintentionally infringes upon existing protected works. As AI becomes more capable of producing original content, it also risks replicating or deriving elements from prior works in ways that may violate current IP laws-necessitating safeguards to protect third-party rights.

These issues remain unsettled and are the subject of considerable scholarly and legislative debate. Notably, French legislation has yet to articulate any specific legal standards for autonomously generated content by AI systems. This absence was highlighted in the European Parliament's "Delvaux Report"[4] which candidly acknowledged the legal vacuum in addressing AI-generated intellectual works. While certain provisions within existing European law may provide partial coverage, a comprehensive overhaul is likely necessary to ensure legal systems are both forward-looking and adequately protective.

In response, legislators in Europe appear to face two primary policy paths, both requiring serious consideration:

The first path would involve denying legal protection to AI-generated works altogether, effectively designating them as part of the public domain. This approach would permit unrestricted use of such content, which could undermine creative incentives and weaken the theoretical underpinnings of intellectual property in an era increasingly driven by technological innovation[5]. Moreover, such a stance may leave AI-produced outputs vulnerable to exploitation, placing national legal systems at a disadvantage in adapting to the pace of digital transformation.

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[1] The employee who is the author of a design shall remain the holder of the copyright, pursuant to Article L. 111-1 of the French Intellectual Property Code. Therefore, the employer must conclude a contract with the employee for the assignment of economic rights in order to obtain ownership over the creations.

In contrast, the employee who is the author of software will see their rights automatically transferred to the employer, without the need for a contractual arrangement. This results from Article L. 113-9 of the Intellectual Property Code, which attributes the economic rights in software and its documentation to the employer when created by one or more employees in the course of their duties or following their employer's instructions.

[2] Abbott, R., The Reasonable Robot: Artificial Intelligence and the Law, Cambridge University Press, 2020, p. 1084.

[3] Grimmelmann, J., Copyright for literate robots, Iowa Law Review, vol. 101, no. 2, 2016, pp. 618.

[4] Charlotte Alleaume and Alice Pigeon-Bormans, Robot Authors' Rights: We Are Trying to Understand, in Légipresse, 2017, p. 523.

[5] Gervais, D. J., Op.cit, p 429.

The second path would entail revising existing intellectual property laws to incorporate protections for AI-generated creativity. This would involve adapting legal frameworks to address the distinctive nature of content generated without human involvement, thus recognizing the digital environment as a legitimate space for intellectual contributions. We advocate for this reformist approach despite its complexities[1].

One of the central challenges lies in justifying intellectual property protection when the creator lacks legal personhood - a concept historically reserved for humans, who are presumed to have conscious awareness and agency. Traditionally, IP rights are predicated on the notions of authorship, ownership, and liability, all of which are conceptually tied to human creators[2].

Yet, an alternative perspective suggests that the rationale for extending IP rights to AI-generated content is not to benefit the AI per se - since it lacks legal standing and subjective needs - but to allow the human entities behind these systems (developers, users, or corporate owners) to commercialize and protect the outputs effectively[3]. This line of reasoning, however, has met resistance in courts across jurisdictions such as Australia, the Netherlands, and the United States, where rulings have consistently emphasized the necessity of human authorship for IP protection[4].

Therefore, under prevailing legal doctrine, fully autonomous creations -particularly in robotics - remain outside the scope of intellectual property protections.

Nevertheless, this exclusion warrants reconsideration. Comparative legal reasoning, often employed in Western jurisprudence, has invoked analogies between AI and animals to justify denying rights to the former. For example, works created by animals have been denied copyright on the basis that animals lack self-awareness or intentionality. However, this analogy is arguably flawed[5].

Unlike animals, AI - especially advanced humanoid robots - can exhibit a form of cognitive processing due to their algorithmic design and access to expansive data sets. This allows them to simulate a kind of functional awareness, which could be interpreted as a form of synthetic intentionality. Denying protection solely on the grounds of non-human legal status may thus be an overly rigid application of traditional doctrine[6]. This leads to the broader question: Should AI be granted a new or limited form of legal personality to bridge the conceptual divide and enable the protection of its outputs? While this remains a contentious issue, it is one that legal systems must increasingly grapple with as artificial intelligence becomes a more integral part of the creative and industrial landscape[7].

1.2 The Influence of AI-Driven Technological Advancements on the Role of Innovation in Establishing Intellectual Property Protection:

Contemporary intellectual property frameworks extend legal protection to creative

[1] Perel, M., & Elkin-Koren, N., Black box tinkering: Beyond disclosure in algorithmic enforcement, Florida Law Review, vol. 69, no. 2, 2020, p 427.

[2] Samuelson, P., Op.cit, p 380.

[3] Court of Cassation (First Civil Chamber), 15 January 2015, no. 13-23.566: JurisData, no. 2015-000315.

[4] Court, Telstra Corporation Ltd v. Phone Directories Company Pty Ltd (2010), FCAFC 149 § 335.

[5] Samson, L., Artificial intelligence and legal personality: Rethinking responsibility in the age of autonomous systems, European Law Journal, vol. 29, no. 2, 2023, p 210.

[6] It should be noted that the concept of "awareness" referred to in this context pertains to the awareness necessary to perform the act itself, rather than the awareness of the consequences or legal outcomes of the act. The former refers to the cognitive understanding required to carry out a creative or intellectual work, while the latter concerns the attribution of legal responsibility for the act's consequences - an issue that falls under the doctrine of liability.

[7] Calo, R., Op.cit, p 195.

outputs of all kinds - regardless of their discipline, format, or method of expression - so long as they comply with legal norms and do not infringe upon public order or accepted standards of morality. Across jurisdictions that adhere to either civil law traditions or common law systems, a consistent requirement persists: for a creation to be eligible for protection, it must demonstrate a degree of originality and, critically, innovation. This foundational principle spans literary, artistic, scientific, and industrial domains, positioning innovation as a prerequisite for any claim to intellectual property rights[1].

Innovation functions as the core element underpinning copyright and other IP regimes. It reflects the distinctive features that set a work apart from others and justifies its recognition as a protected intellectual product[2]. Once such innovation is recognized, the legal system confers both moral and economic rights upon the creator. In contrast, the absence of innovative contribution renders a work legally unprotected and strips the creator of entitlement to any intellectual property claims.

Traditionally, the legal understanding of innovation has been well-defined, supported by statutory language and judicial interpretation. However, the rise of the Fourth Industrial Revolution - and the increasing integration of artificial intelligence into creative and industrial processes - has significantly reshaped how innovation is perceived within the realm of intellectual property law. These rapid developments now compel legislators and scholars to reevaluate whether existing standards remain fit for purpose in an AI-driven era[3].

Historically, definitions of innovation often emphasized the role of the human creator, framing originality in terms of individual personality and expressive uniqueness. Yet, the digital age has ushered in a paradigm shift toward a more objectivized assessment - one that focuses on the characteristics and value inherent in the creation itself, independent of the creator's identity. Within this evolving framework, innovation is no longer a static or person-dependent concept. Rather, it is increasingly understood as a flexible criterion, sensitive to the qualities of the output itself and capable of encompassing non-human sources of creative activity, including those driven by advanced algorithmic processes.

1.2.1 Reframing the Concept of Innovation through Juridical Theory and Judicial Practice:

The notion of innovation is inherently fluid, shaped by the temporal and technological milieu in which it arises. What may once have been deemed original and inventive can, with the passage of time, lose its distinction as novelty becomes commonplace. Moreover, the character of innovation is often shaped by the nature and purpose of the creative output, rendering it a concept without a fixed form. For example, in artistic contexts, originality may be embedded in the thematic or compositional structure, whereas in works such as translations, it may lie solely in the expressive technique - reflecting the intellectual exertion and interpretive sensitivity of the translator[4].

In doctrinal discourse, many scholars contend that for any intellectual creation to qualify for protection under copyright or similar regimes, it must exhibit a degree of

[1] Bonadio, E., Frosio, G., & Liu, H., "Redefining boundaries in innovation and knowledge domains: Investigating the impact of generative artificial intelligence on copyright and intellectual property rights", Journal of Innovation & Knowledge, vol. 9, no. 1, 2024, p 29.

[2] André Lucas & Pierre Sirinelli, Originality in Copyright Law, in JCP G, No. 23, 9 June 1993.

[3] Shetty, A. (2024). The impact of artificial intelligence on intellectual property rights. International Journal of Advanced Legal Research, 4(1), 1–15

[4] Abd al-Rashid Ma’moun & Dr. Mohamed Sami Abd al-Sadeq, Author’s Rights and Related Rights under the New Intellectual Property Protection Law No. 82 of 2002, Book I, Dar Al-Nahda Al-Arabiya, Cairo, 2008, p. 111.

originality.[1]. One school of thought interprets innovation as the author's "intellectual fingerprint" - an expressive hallmark signifying their unique contribution[2]. Another perspective adopts a more impersonal lens, asserting that a work qualifies as original as long as it is independently developed and not plagiarized, provided it crosses a minimal threshold of creativity[3].

Legal scholars have also differentiated between the criteria of innovation as applied to copyright versus industrial property rights. In the former, originality need not imply distinctiveness or rarity; rather, the work must merely result from the author's skill, labor, and discernment - even if the outcome appears modest or simple in nature.

This divergence highlights a central distinction: while originality in copyright law is often understood as a subjective measure linked to the author's individuality, novelty in patent law is assessed objectively based on whether the creation is unprecedented. Hence, copyright protection hinges on the presence of personal expression, while industrial property protection is grounded in the factual absence of prior art[4].

According to conventional theory, a literary or artistic creation must embody the personality of its creator, bearing stylistic and conceptual traits that mark its source. From this viewpoint, originality is synonymous with personal input - suggesting that any protected work must metaphorically bear the creator's "signature". Consequently, mere compilations of official texts or laws are not regarded as creative unless they are accompanied by a discernible intellectual structure or organizational logic that evidences the compiler's ingenuity".

Comparative legal studies reveal significant differences in how legal systems approach the threshold of innovation. Civil law jurisdictions often emphasize the work's independence from existing sources, setting a lower bar for protection. Common law traditions, in contrast, place greater weight on the presence of a distinct authorial voice, requiring a more engaged creative process[5].

Technological advancements, particularly in the realm of digital content and artificial intelligence, have prompted jurists - especially in civil law countries - to advocate for a more objective and adaptable understanding of innovation. The rigid paradigms that served traditional literary and artistic works appear increasingly ill-suited for assessing modern, tech-driven outputs such as software, algorithmic compositions, or machine-generated databases.

A contentious issue in this evolving discourse concerns the legal status of software and AI-driven creations. Some scholars argue that software developers, unlike traditional artists, operate within a technical framework where creativity is subordinate to functionality[6]. On this basis, they question the appropriateness of granting copyright protection to such outputs. However, jurisprudence has begun to challenge this view. For instance, the French Court of Cassation, in a significant ruling, endorsed a broadened interpretation of innovation, affirming that any creation reflecting the

[1] Abd al-Hamid al-Tantawi, Intellectual Property Protection and the Legal Regulation of Content Control, Dar Al-Fikr Al-Jami'i, Alexandria, 2001, p. 18.

[2] André Francon, Course on Literary, Artistic, and Industrial Property, Cd. ed., Les Cours de droit, 1996, No. 21, p. 30.

[3] Ibid.

[4] Jurcys, P., & Fenwick, M., Originality and the future of copyright in an age of generative AI, arXiv preprint, arXiv:2309.13055, 2023. Retrieved from https://arxiv.org/abs/2309.13055.

[5] Istrate, D., AI-generated content: Copyright implications, IP STARS, 2025. Retrieved from https://www.ipstars.com/NewsAndAnalysis/AI-generated-content-copyright-implications/Index/10490

[6] Farouk Al-Abassiri, Toward an Economic Concept of Copyright, Dar Al-Nahda Al-Arabiya, Cairo, 2004, p. 9.

intellectual engagement of its author - software included - deserves legal protection[1].

In that decision, the court articulated a dual-faceted understanding of innovation: one component being subjective and rooted in the creator's intellectual contribution, and the other being objective and tied to novelty[2]. While the latter is more pertinent to patent law, the former suffices to ground protection in copyright frameworks. Software, despite its technical character, can embody originality if its structure or code reflects personalized, non-trivial creative decisions[3].

Nevertheless, software and AI-generated content differ fundamentally from conventional copyright subjects like novels or paintings. They are often driven by utility rather than inspiration and typically conform to pre-established technical objectives. This functional orientation complicates attempts to attribute such works to an author's personality. Still, the presence of creativity should not be denied simply because the form of expression differs. Whether in poetry, painting, or programming, human agency and intellectual effort remain central[4].

Accordingly, innovation must be viewed as a flexible legal standard - one that adapts to the expressive modalities of different disciplines. The evaluative criteria for originality may vary across literary, musical, and digital works, yet the core remains the same: an interplay between individual creativity and an identifiable contribution that surpasses the ordinary[5].

Turning specifically to the realm of artificial intelligence, the capacity for innovation within these systems is increasingly evident. While human ingenuity remains the primary engine of creative development, AI technologies - designed and refined by humans - are undeniably contributing to the generation of novel and original content. This invites legal recognition of AI-related outputs as potentially protectable under current frameworks, albeit with necessary adjustments.

One particularly challenging application lies in multimedia works that integrate audio, visuals, and interactive elements through digital platforms. These works may appear mechanistic or impersonal at first glance, raising doubts about the presence of a unique creative imprint. However, upon closer inspection, many such productions involve sophisticated integration of artistic elements, demonstrating a form of indirect intellectual effort.

This suggests that even when a work is assembled using automated tools or collaborative technologies, there may still be a creative dimension that warrants protection. As such, the definition of innovation must evolve to encompass new types of intellectual output. Legal systems must remain open to developing nuanced evaluative tools that recognize the complexity of modern creative processes - particularly those facilitated or enhanced by emerging technologies.

In sum, the traditional benchmarks of innovation, while still relevant, must be recalibrated in light of contemporary digital realities. A more elastic, technology-sensitive approach is essential to ensure that intellectual property law continues to fulfill its fundamental purpose: recognizing and rewarding human creativity in all its modern expressions.

1.2.2 The Innovation Requirement in Comparative Legal Frameworks:

In numerous legal systems, the prerequisite of innovation is consistently upheld as a core criterion for the protection of intellectual and creative works.

[1] Michel Vivant & Jean-Michel Bruguière, Copyright and Related Rights, 2nd ed., Dalloz, Paris, 2012, No. 255.

[2] Michel Bibent, The Law of Information Processing, Nathan, Paris, 2000, p. 76.

[3] Christophe Caron, Copyright and Related Rights, 4th ed., LexisNexis, Paris, 2015, No. 87.

[4] Ibid.

[5] Bilal Othman Abdullah, Intellectual Property Rights and User Rights in the Digital Library, Al-Adl, 2009 Issue, p. 550.

A review of France's Intellectual Property Code No. 597 of 1992 (as amended) indicates that the legislation is anchored in the principle of originality as the basis for copyright protection. The law connects the author's legal entitlement to exclusive rights with the presence of creative contribution within the work. Specifically, Article 112 underscores that works exhibiting intellectual individuality - demonstrated through originality - are legally protected[1].

Conversely, the United Kingdom's Copyright, Designs and Patents Act 1988, effective as of August 1, 1989, does not provide an explicit legal definition of innovation. Nevertheless, the Act acknowledges the importance of originality by outlining that copyright arises for certain categories of works, contingent upon the fulfillment of originality as a qualifying element[2].

The United States takes a similar approach through its Copyright Act of 1976. Under Section 102(a), protection is afforded to "original works of authorship," thereby making originality a prerequisite for legal recognition of copyright[3].

In contrast, Egyptian law provides a more defined articulation of innovation. Article 138(2) of the Egyptian Intellectual Property Law No. 86 of 2002 describes innovation as "the creative aspect that confers originality upon a work." This articulation demonstrates a flexible and adaptive understanding of innovation, especially suited to modern contexts such as technological and AI-driven creations[4].

Similarly, the UAE Federal Law No. 7 of 2002 concerning Copyrights and Neighboring Rights defines innovation in Article 1 as "the creative character that imparts originality and distinctiveness to the work." This approach parallels the Egyptian model, reinforcing the separation between the two concepts while acknowledging their mutual relevance to the legal framework[5]

In Saudi Arabia, the Copyright Law defines innovation under Article 1 as "a creation characterized by elements of novelty or by a distinctive nature not previously known." This definition goes further than those of Egypt and the UAE, as it embraces an absolute notion of innovation - closely resembling the concept of novelty in patent law. The Saudi legislator's approach highlights a stricter standard for protection, particularly where works must reflect an unprecedented character to qualify[6]

These comparative observations underscore that, while originality remains the dominant legal standard across most jurisdictions (e.g., France, UK, US), interpretations of what constitutes innovation - and how it intersects with originality - vary significantly. Countries like Egypt, the UAE, and Saudi Arabia have developed more detailed or rigorous conceptions of innovation, particularly in response to the challenges and complexities posed by emerging technologies, including artificial intelligence.

1.2.3 Reassessing Innovation in Intellectual Property Law Amid Advances in Artificial Intelligence:

The core legal framework governing the protectability of intellectual creations has largely retained its formal criteria - even as groundbreaking technologies like artificial intelligence (AI) and digital systems have emerged. In principle, the requirement of innovation continues to serve as a foundational condition for securing protection, regardless of whether the work was conceived in a digital or traditional environment. Nevertheless, the pace and scope of technological change now

[1] Code de la propriété intellectuelle [French Intellectual Property Code], Law No. 597 of 1992, as amended through 2024.
[2] Copyright, Designs and Patents Act 1988, c. 48 (UK).
[3] U.S. Copyright Act, 17 U.S.C. § 102 (1976).
[4] Egyptian Intellectual Property Law No. 82 of 2002.
[5] UAE Federal Law No. 7 of 2002 on Copyrights and Neighboring Rights.
[6] Saudi Copyright Law, as amended by Royal Decree No. M/41 of 1442H (2020).

demand a reinterpretation of what constitutes innovation, while preserving its essential role within legal doctrine[1].

The advent of the digital age has significantly impacted how legal systems evaluate creative works, especially concerning the innovation threshold. In practice, this shift has resulted in expanded legal recognition for authors, even in jurisdictions traditionally aligned with civil law systems, where innovation was once tied closely to the personal expression of the creator.[2] Increasingly, courts and lawmakers have adopted a more objective standard - centered on intellectual effort - thereby reducing reliance on the author's individual imprint as the sole measure of innovation[3].

This reorientation has blurred the lines that once clearly separated the concepts of "novelty" and "innovation." While these notions were historically distinct, emerging digital works - such as software, databases, and multimedia applications - have complicated their legal differentiation. The characteristics of such works challenge the suitability of traditional innovation standards rooted in literary and artistic paradigms[4].

A central difficulty arises in evaluating how outputs generated by machines can reflect human creativity or personal authorship. The highly technical nature of these works complicates their alignment with the subjective standards typically used to assess innovation. Furthermore, existing frameworks for industrial property are often ill-suited to accommodate such creations, as they impose rigid procedural constraints[5].

The proliferation of AI-generated content and digital media has given rise to novel categories of works that fall outside the scope of traditional legal definitions. To address this, it has become increasingly necessary to expand the legal conception of innovation, enabling the inclusion of such works within the domain of intellectual property protection. One promising approach involves embracing the objective standard employed in common law jurisdictions, which focuses on minimal creative input rather than a strong personal dimension. In this model, innovation is often viewed through an economic lens, with courts recognizing even modest creative contributions as sufficient for protection[6].

This pragmatic shift has begun to influence even civil law systems, which have historically emphasized the personal character of authorship. Gradually, these jurisdictions are moving toward a broader, more flexible interpretation of innovation - especially in contexts involving digital products like software and multimedia. A landmark in this evolution is the jurisprudence of French courts, which initially exhibited inconsistency in applying innovation standards to technological works but eventually embraced a more inclusive approach[7].

One of the most pivotal rulings in this regard was the French Court of Cassation's decision in the Pachot case, which marked a departure from the traditional focus on intellectual effort

[1] Bonadio, E., Salami, I., Hugenholtz, P. B., & Quintais, J. P., Op.cit, p110.

[2] Dreyfus, Generative AI: Balancing innovation and intellectual property rights protection, 2023, May 22. Retrieved from https://www.dreyfus.fr/en/2023/05/22/generative-ai-balancing-innovation-and-intellectual-property-rights-protection.

[3] Bonadio, E., Salami, I., Hugenholtz, P. B., & Quintais, J. P. (2024), Op.cit, p 106.

[4] Ibid.

[5] Dentons, "AI and intellectual property rights", 2025, January 28. Retrieved from https://www.dentons.com/en/insights/articles/2025/january/28/ai-and-intellectual-property-rights.

[6] Mondaq, "IP protection in the age of AI: What's changing?", 2025, February. Retrieved from https://www.mondaq.com/unitedstates/patent/1590116/ip-protection-in-the-age-of-ai-whats-changing.

[7] Dreyfus, "Generative AI: Balancing innovation and intellectual property rights protection", 2023, May 22. Retrieved from https://www.dreyfus.fr/en/2023/05/22/generative-ai-balancing-innovation-and-intellectual-property-rights-protection.

alone. In that case, the court recognized that computer programs - despite their technical nature - can incorporate intellectual input from the author that reflects creative judgment, rather than purely mechanical execution. The judgment affirmed that even technologically complex works may carry an author's personal contribution, thereby warranting protection under copyright law[1].

This legal development was widely welcomed as an acknowledgment of the need to modernize the criteria for innovation in line with technological realities. The requirement to identify an author's personal mark in data processed by a machine became both impractical and conceptually outdated. By shifting toward an objective, creativity-based standard, courts now have greater discretion in determining whether a work qualifies for legal protection. This approach better aligns with the dynamism of technological innovation and provides a legal framework that can evolve alongside it.

Ultimately, the reinterpretation of innovation as a flexible and inclusive criterion ensures that intellectual property law remains relevant and effective in an era defined by rapid digital transformation. It upholds the principle that even a minimal level of originality - regardless of its source - should suffice to trigger legal protection, thereby ensuring that the law keeps pace with technological change.

2. Rethinking Copyright Protection in the Era of Artificial Intelligence:

With the advancement of artificial intelligence technologies and the increasing reliance on them in the creation of creative works, it has become necessary to reconsider the legal framework governing copyright, especially in light of the unprecedented challenges posed by these technologies[2]. Creative works are no longer exclusively the product of human intellect; intelligent systems are now capable of generating texts, music, and artistic outputs that are often indistinguishable from those created by humans. This reality presents fundamental challenges to traditional copyright rules, particularly in determining authorship, the nature and scope of protection, and the adaptability of these rules to rapidly evolving technologies**.**

2.1 Artificial Intelligence and the Question of Legal Entitlement to Intellectual Property Rights:

Under classical intellectual property doctrines, the designation of "author" is traditionally reserved for human individuals who possess both creative faculties and legal personality - two elements deemed essential for the attribution and exercise of intellectual property rights. Within this framework, protected works are presumed to be the product of human mental labor, and legal systems have consistently required that authorship be linked to natural persons or collectives thereof. The foundational legal view has long held that machines or non-human agents lack the capacity for genuine creativity and thus cannot produce works meriting legal protection in the same sense as a human creator[3].

However, the growing sophistication of artificial intelligence has begun to challenge this longstanding paradigm. As AI systems increasingly demonstrate the ability to replicate, and in some instances surpass, human cognitive tasks traditionally associated with artistic or inventive expression, these technologies raise profound legal questions[4]. Chief among them is whether the exclusion of AI from the scope of intellectual property

[1]Ramon Casas Vallés, "The Requirement of Originality," in Research Handbook on the Future of EU Copyright, Edward Elgar Publishing, Cheltenham–UK, 2009, p. 120.

[2] Elkin-Koren, N., Rethinking authorship in the age of generative AI, Journal of Law and Technology, vol. 34, no. 2, 2023, pp. 105–124...

[3] Bilal Mahmoud Abdullah, Copyright in Arab Legislation, Arab Center for Legal and Judicial Studies, League of Arab States, Beirut, n.d., p. 29.

[4] World Intellectual Property Organization (WIPO), WIPO Technology Trends 2021: Artificial Intelligence, 2021, p. 7.

rights remains tenable under current legal standards - and whether the existing legal architecture can accommodate such non-human entities.

Despite the capacity of some AI models to produce outputs that satisfy modern criteria for originality and innovation, these systems are, under prevailing legal norms, not capable of holding authorship rights. The reason lies in the absence of legal personhood - an essential condition for holding, transferring, or enforcing intellectual property rights. In effect, while an AI-generated work may meet the substantive requirements for protection, the lack of a legally recognized author prevents the attachment of rights under most jurisdictions[1].

Certain legal theorists argue that works created without meaningful human oversight or creative input should not fall within the domain of copyright protection. This position reflects a commitment to the principle that authorship must derive from human agency and intentionality. On this basis, creative outputs autonomously produced by AI - however sophisticated - are deemed ineligible for protection, as they originate from entities that lack legal identity and the capacity for rights and obligations[2].

This approach aligns with the broader distinction in law between natural persons - actual human beings - and juridical persons, such as corporations or institutions, which are recognized as legal entities for specific purposes. Natural persons are grounded in tangible human existence, while juridical persons are constructs of legal fiction. AI systems, by contrast, do not currently fit into either category, presenting a significant obstacle to their legal recognition as rights holders.

Nevertheless, the exclusion of AI from legal personhood may no longer suffice to address the realities of AI-driven innovation. The potential for AI to functionally assume roles analogous to authors or inventors - coupled with the legal implications of their outputs potentially infringing on existing rights - necessitates a reevaluation of liability, attribution, and the enforcement of intellectual property norms[3].

The central legal issue, therefore, is whether and how the law should evolve to recognize AI systems within the spectrum of legal subjects. This invites a broader inquiry into whether existing legal categories can be expanded to include AI, or whether entirely new frameworks are required to address the unique characteristics and capabilities of artificial intelligence as it relates to intellectual property creation and regulation.

2.1.1 Rethinking Legal Personality: The Challenge of Integrating Artificial Intelligence into Established Legal Constructs:

A fundamental distinction must be made between natural personality - an inherent attribute of human beings by virtue of their existence - and legal personality, which denotes the legal capacity to hold rights and be subject to duties. While legal personality initially pertained solely to individuals, legal systems have long extended this status to other non-human entities[4]. Over the course of legal development, particularly from the 19th century onward, a broader application of legal personality emerged to accommodate the growing role of entities such as corporations, trade unions, and economic organizations. These institutions, due to their functional significance and social impact, necessitated formal legal recognition through the doctrine of juridical personality.

More recently, some European jurisdictions have expanded this recognition even further,

[1] Samuelson, P., Can copyright law survive generative AI? Communications of the ACM, vol. 66, no. 5, 2023, p 29.

[2] Bilal Mahmoud Abdullah, op.cit, p 29.

[3] Doshi, P., "Artificial intelligence and the challenge to intellectual property law", Harvard Journal of Law & Technology, vol. 35, no. 1, 2022, p 199...

[4] Solaiman, S. M., "Legal personality of robots, corporations, idols and animals", Artificial Intelligence and Law, vol. 25, no. 2, 2017, p 260.

granting animals a form of limited legal standing. This development reflects an evolving understanding of legal subjecthood, whereby animals are now seen as entities possessing rights that merit protection, and where violations of such rights may trigger legal consequences, including liability[1].

Legal personality, as currently understood, is no longer confined to the human form or presence. It now encompasses entities that exist in non-physical or institutional dimensions, including legal fictions. While this expanded understanding includes both human and corporate entities, it increasingly also considers non-human life forms, acknowledging the unique legal attributes applicable to each[2].

In light of this legal evolution, it is necessary to interrogate the ontological status of artificial intelligence. Specifically, can AI be meaningfully categorized within the existing framework of legal subjects? Natural persons are defined by their biological, tangible presence. AI, on the other hand, though not organic, may be said to occupy a form of physical reality - whether through hardware, networked infrastructure, or its tangible effects in the world[3]. Yet, unlike purely juridical persons, which exist only by legal fiction and lack any perceptible form, AI systems interact with the environment and can be observed performing complex tasks. This raises the argument that AI may constitute a distinct category of tangible, yet non-human, agents.

Nevertheless, mere physical presence does not suffice to confer legal personality. Many observable, functional objects - ranging from machines to manufactured tools - are not considered legal persons. Historically, artificial intelligence has been treated similarly: as a functional apparatus devoid of legal subjectivity. However, as AI systems advance in their capabilities - exhibiting traits such as autonomous decision-making, perception, creativity, and interpretive analysis - their traditional classification as mere tools becomes increasingly inadequate[4].

This technological progression compels legal scholars and policymakers to revisit the foundational principles governing legal personhood. The capacity of AI systems to engage in activities resembling those of sentient beings raises the question of whether certain AI applications merit recognition as legal subjects. If so, it becomes essential to define criteria that would enable their inclusion within the legal framework - whether through adapting existing categories or establishing new legal constructs specific to AI.

In summary, the integration of artificial intelligence into the legal landscape poses significant conceptual and normative challenges. The evolving nature of AI, and its increasing resemblance to human cognitive and creative functions, underscores the urgency of developing a coherent legal response that can adequately accommodate its presence and impact.

2.1.2 The Gradual Shift Toward Granting Legal Personhood to Artificial Intelligence:

Artificial intelligence systems today possess attributes that set them apart from traditional machines - such as autonomous behavior, deep learning, and the ability to simulate reasoning, perception, and creativity. These capabilities bring them closer, in function if not in form, to human agents[5]. Such advancements have influenced European legal thought, leading to

[1] Suzanne Antoine, Report on the Legal Status of Animals, submitted to the Minister of Justice, 10 May 2005, p. 23.

[2] Nicolas Mathey, The Fundamental Rights and Liberties of Private Legal Persons, RTD civ., 2008, p. 206

[3] Pagallo, U., The Laws of Robots: Crimes, Contracts, and Torts, Springer, 2020, p. 52.

[4] Calo, R., Robots in American Law, University of Washington Law Review, vol. 117, no. 4, 2016, p 560.

[5] Rodolphe Gelin and Olivier Guilhem, Is the Robot the Future of Man? La Documentation française, Paris, 2016, p. 8.

proposals for distinct legal safeguards tailored to AI technologies. Moreover, as the integration of AI into society deepens, the urgency grows to develop legal mechanisms that can address risks arising from their misuse or overreliance.

The European Parliament has notably taken a forward-looking approach, seeking to preempt legal and ethical dilemmas by addressing them before they escalate. In response to the accelerating sophistication of AI applications and their expanding presence across industries, lawmakers have acknowledged that existing legal tools may prove insufficient to govern these entities effectively[1].

This proactive legislative stance is grounded in the concept of necessity. Rather than suggesting blanket legal personhood for all AI-driven systems, the Parliament has focused its attention on highly autonomous and adaptive forms of AI - particularly those capable of learning and evolving independently[2]. This signals a nuanced approach: legal recognition should correspond to the complexity and capabilities of the AI system in question.

One outcome of this deliberation is the theoretical introduction of a new legal category - potentially "electronic persons" - intended for intelligent robots that demonstrate a high degree of autonomy. The aim is to establish accountability frameworks in cases where these entities cause harm, thereby allowing for the attribution of liability[3].

To mitigate these concerns, experts emphasize the need for strong regulatory guardrails. If legal status is extended to AI, it must come with strict oversight mechanisms ensuring that these technologies remain subordinate to human authority. Without such measures, legal recognition could backfire, leading to unpredictable outcomes and potentially large-scale systemic failures[4].

Given the growing relevance of AI - particularly in the robotics sector - many believe that careful legal calibration is essential. While robots are poised to permeate virtually all areas of life, from healthcare to manufacturing, the rapid pace of development increases the risk of errors in design or behavior, which could have serious social consequences. As competition in the AI industry intensifies, the margin for oversight failures narrows[5].

The European Economic and Social Committee (EESC) has adopted a careful and deliberate position on this issue. Rather than endorsing the term "legal person," the Committee suggests the label "guided person," emphasizing that these entities must operate under direct human influence[6]. This terminology highlights both a conceptual shift and a commitment to limiting AI autonomy within a structured legal framework[7].

By referring to AI as a type of "person," the EESC implicitly acknowledges its legal relevance, but the modifier "guided" reinforces the necessity of maintaining clear boundaries. AI, in this view, must remain a tool under human direction, not an independent actor.

As a result, there appears to be an emerging consensus - albeit a cautious one - within the European legal landscape: advanced AI systems may be eligible for a limited and

[1] Sujul Kaviti, Robotics Law, Journal of the Dubai Space Institute, No. 21, April 2015, p. 33

[2] Cándido García, The European Parliament: Civil Law Rules on Robotics of 2017, Global Policy Watch, 2017, available at: https://www.globalpolicywatch.com

[3] European Parliament, Resolution with Recommendations to the Commission on Civil Law Rules on Robotics (2015/2103(INL)), 16 February 2017, p. 8.

[4] Ihab Khalifa, The Risks of Artificial Intelligence Escaping Human Control, Al-Mustaqbal Center for Advanced Research and Studies, 30 July 2017, available at: https://futureuae.com

[5] T. Berg, E. Buffie, and L. F. Zanna, Robots, Growth, and Inequality, Finance & Development, International Monetary Fund, Vol. 53, No. 3, September 2016, p. 11.

[6] Safwat Salama, op. cit., p. 41.

[7] Rafał Mańko, Civil Law Rules on Robotics, European Parliamentary Research Service, Members' Research Service, European Union, 2017.

tightly defined form of legal personhood, contingent on their capabilities and subject to continuous human oversight.

In conclusion, while the legal recognition extended to AI does not yet cover areas such as labor rights, innovation ownership, or property entitlements, there is room to interpret the current trajectory as laying the groundwork for such rights in the future. This is particularly relevant to the scope of intellectual property law: if an AI system generates an original or inventive creation, the possibility arises for it to be granted protective rights - perhaps exercised on its behalf by designated legal proxies. This approach would align with broader European objectives to responsibly manage the development, use, and commercialization of AI technologies.

2.2 Accountability of Artificial Intelligence in Cases of Intellectual Property Violations:

While artificial intelligence systems are not currently recognized as legally accountable entities under existing legal frameworks - particularly in cases involving the infringement of intellectual property rights - it is increasingly difficult to overlook the evolving legal and technological landscape. With AI systems demonstrating significant capabilities in creative and inventive output, and considering the European Union's legislative steps toward granting certain AI entities a form of electronic legal status, there is a growing possibility that such systems might, in due course, be identified as creators or inventors. Accordingly, they may hold rights typically reserved for natural or legal persons under intellectual and industrial property regimes, and infringements of those rights could theoretically trigger liability under applicable laws[1].

Within this emerging context, the question arises as to how civil liability might be applied. General principles of civil law dictate that a party who causes harm to another through a wrongful act is obliged to compensate for the resulting damage[2]. When the elements of fault, harm, and causation are present, legal redress becomes available - whether the claim is grounded in tort or contract law. This raises a critical issue: can conventional civil liability doctrines effectively address harm arising from the conduct of AI systems that violate intellectual property protections?

It seems that traditional liability rules may fall short in responding to the novel challenges presented by autonomous systems. The core of the problem lies in the unprecedented nature of AI technology, which often defies the neat allocation of blame through standard legal concepts.

Artificial intelligence has evolved into a category of autonomous digital agents with decision-making abilities that far exceed the functions of traditional machines. These systems cannot reasonably be compared to non-human actors like animals, rendering analogies based on strict liability for animals or vicarious responsibility insufficient in this context[3].

A closer look at the European Parliament's resolution on civil law and robotics, adopted in 2017, reveals the introduction of a new conceptual framework: the idea of a "designated human proxy" who would bear legal responsibility for damages caused by AI systems.."[4] This concept rests on the foundational principles of fault and the duty of care, adapted to the complexities of modern technological systems.

The EU's movement toward formally acknowledging certain AI systems as holders of electronic legal personality marks a

[1] European Parliament, European Civil Law Rules in Robotics, European Parliament Resolution 2015/2103(INL), 2017, p. 11.

[2] Fairgrieve, D., & Gjølberg, M., "Product Liability for Emerging Technologies", in Fairgrieve, D., et al. (Eds.), Product Liability in the EU, Oxford University Press, 2020, p 96.

[3] Pagallo, U, Op.cit, p 93.

[4] European Parliament, European Civil Law Rules in Robotics, European Parliament Resolution 2015/2103(INL), 2017, p. 11.

significant legal shift. It reflects an understanding that these systems can no longer be treated as passive tools entirely under human control. This development challenges outdated liability models built for predictable, mechanistic devices and underscores the need for adaptive legal responses when dealing with independently operating AI.

Holding AI owners liable based on outdated doctrines may prove unjust, especially when the systems act outside the owners' effective command. Likewise, assigning blame to developers or programmers may be unreasonable where unpredictable outcomes arise from external, uncontrollable factors that were not foreseeable at the time of design or deployment. In such scenarios, attributing fault to programmers for every unintended consequence would not align with principles of fairness or legal coherence[1].

To address this gap, the European legislative response has favored the adoption of the "responsible human proxy" model. This approach offers a pragmatic framework for distributing liability, ensuring that responsibility is allocated according to each party's role - be it in the development, deployment, or oversight of the AI system - and their respective degree of negligence in preventing foreseeable risks.

2.2.1 Reconceptualizing the Legal Accountability of the Human Proxy for AI-Induced Intellectual Property Violations:

After prolonged philosophical and legal discourse, the European Parliament has articulated a framework based on the principle that artificial intelligence systems are inherently tools developed for human use. These systems - though highly efficient and capable of independent reasoning modeled on human cognition - cannot be held personally liable under current legal doctrines. This is due to the fundamental legal obstacle of assigning personal responsibility to non-human agents for acts that breach protected intellectual property rights and inflict damage on third parties[2]. As a result, the obligation to redress such harms is transferred to a designated human actor, referred to in some legal traditions (notably French) as le compagnon du robot - the human companion or proxy of the machine[3].

Under the doctrine of human proxy liability, the European legislative approach refrains from classifying these AI agents as either inanimate objects or irrational entities. Instead of casting the responsible individual as a "guardian" or "supervisor," the legal framework adopts the term "proxy," reflecting a deliberate shift toward recognizing AI systems as entities with a distinctive - though still undefined - legal character. The inability to directly impose legal responsibility on such systems is attributed not to any deficiency in the AI itself but to the limitations of the existing legal architecture[4].

By employing the concept of a "proxy" rather than a custodial figure, the law effectively gestures toward a more expansive notion of legal personality for AI - distinguishing this model from traditional frameworks of guardianship or trusteeship. Nevertheless, the European Parliament has yet to issue a definitive articulation of the legal personality or the scope of rights and obligations that may one day be assigned to AI systems[5].

Though AI technology is purpose-built to serve humans, European legal doctrine does not classify such systems as legal

[1] Bantekas, I., & Hodgkinson, T., Artificial Intelligence and Human Rights, Oxford University Press, 2021, p. 118.

[2] European Parliament, European Civil Law Rules in Robotics (2015/2103(INL)), 2017.

[3] Anne Boulange and Carole Jaggie, Éthique, responsabilité et statut juridique du robot compagnon : revue et perspectives, IC2A, No. 13.

[4] Section AD, The European Parliament, Civil Law Rules on Robotics, Plenary Sitting, Report of 27 January 2017, p. 7.

[5] European Parliament, Report with Recommendations to the Commission on a Civil Liability Regime for Artificial Intelligence (2020/2014(INL)), 2020, p. 6.

subordinates. Traditionally, a subordinate is subject to the direction and oversight of a legally competent principal. However, the dynamic between AI developers and their creations does not fit this paradigm. These machines are programmed with the capacity for autonomous behavior, making direct attribution of liability to them problematic. This disjunction has prompted legislators to impose accountability on a human intermediary instead - thereby treating AI as a legally distinct and exceptional entity[1].

Analogizing the liability of the human proxy to that of a guarantor introduces additional complications. In conventional suretyship, a guarantor agrees to satisfy an obligation - even one that is conditional or prospective. However, this analogy falters in the AI context, where the identity of the injured party is often unknown at the moment the harm occurs. Furthermore, legal principles generally forbid the imposition of surety obligations by statutory fiat. Nonetheless, European law diverges from this principle by imposing mandatory liability on the proxy through legislative authority, thereby bypassing the consensual nature of traditional guarantees.

It is also crucial to differentiate the human proxy regime from liability insurance schemes. Both aims to compensate unidentified victims, but their objectives diverge significantly. Liability insurance primarily shields the wrongdoer from financial risk by transferring that risk to an insurer. In contrast, the proxy system is designed to guarantee equitable remedies for victims in instances where restitution from the AI system itself is unfeasible. Importantly, while insurance coverage requires a licensed provider, European regulations permit the human proxy to independently procure insurance to cover civil liabilities associated with the actions of AI systems recognized under EU law[2].

Moreover, the proxy model should not be conflated with classical legal representation. Traditional agents act on behalf of another party, typically binding the principal in legal dealings without assuming personal liability. Conversely, the proxy assumes direct responsibility for the conduct of the AI throughout its operational lifecycle.

The recognition of human proxy liability - particularly in the sphere of intellectual property infringement by AI - represents a novel evolution in legal thought. Although it invites substantial theoretical and regulatory scrutiny, the model underscores the pressing need for targeted legislative action to define its parameters. The European Parliament's adoption of this approach is based on the concept of derived legal liability: in specific cases, responsibility shifts from the autonomous system to a human intermediary.

Two principal forms of liability are identified under this approach[3]:

Primary or Full Liability: This arises when the human proxy is found culpable through proof of fault, harm, and causation in connection with the AI's creation, oversight, or operational behavior. The guiding principle here is proportionality - the higher the AI's degree of autonomy, the greater the scope of liability imposed on the proxy, unless the AI has reached a level of independence sufficient to relieve the proxy of all responsibility[4].

Operational Negligence: This form of liability occurs when the proxy fails to mitigate foreseeable risks associated with the AI's deployment. In such instances, the proxy is held liable for negligent oversight, including acts or omissions that could have been

[1] Bantekas, I., & Hodgkinson, T., Op.cit, p. 115.

[2] Leenes, R., Palmerini, E., Koops, B. J., Bertolini, A., Salvini, P., & Lucivero, F., "Regulatory Challenges of Robotics: Some Guidelines for Addressing Legal and Ethical Issues", Law, Innovation and Technology, vol. 9, no. 1, 2017, p 26.

[3] European Parliament, Civil Law Rules on Robotics, European Union, 2017, p. 20 ("Humans, not robots, as the responsible agents").

[4] European Parliament, European Civil Law Rules in Robotics (2015/2103(INL)), 2017, p. 16.

reasonably prevented during the machine's functioning[1].

In sum, the legal construct of the responsible human proxy stems from a recognition that AI, while capable of autonomous functioning, may cause harm as a result of defects in design, administration, or execution. When such harm is foreseeable and avoidable, the burden rightfully shifts to the designated human actor tasked with oversight and risk mitigation.

2.2.2 Application Scope of the Legal Framework Assigning Liability to Human Proxies for AI Misconduct:

European legal authorities have identified distinct situations in which a designated human actor may bear legal responsibility for unlawful actions committed by intelligent machines. This framework assigns liability to a human proxy when AI behavior leads to harm, particularly in the context of violations against third-party intellectual property rights[2]. The following roles are primarily considered under this liability structure:

AI Manufacturer: This is the party responsible for the development and fabrication of the artificial intelligence system. They may be held accountable when manufacturing flaws lead to system malfunctions. For example, a defect during the production stage could cause an AI to improperly access protected digital content or confidential data[3].

System Operator: This refers to an individual with specialized training who actively runs or manages the AI system. For instance, someone overseeing an AI-driven platform in the financial sector may incur liability if errors occur during its operational use due to negligent oversight or mismanagement[4].

AI Owner: The legal possessor of the intelligent system, who may deploy it either for personal tasks or client-facing services. If the AI acts under their direction and causes harm, the owner may be held liable[5].

End User: A person who interacts with or employs the AI system without owning or operating it directly. Despite not holding technical or proprietary control, such users can still be deemed responsible if their engagement with the AI results in adverse consequences to others[6].

European legislative trends increasingly support mandatory civil liability insurance for developers and owners of AI technologies. The rationale behind this policy direction is to ensure that victims of AI-caused harm are compensated appropriately and that financial accountability is fairly distributed.

In practice, individuals whose moral or intellectual rights are infringed by an AI system may seek legal recourse against the corresponding human proxy assigned to the machine. Once a court or authority confirms the liability and awards compensation, the responsible proxy may then claim reimbursement through their civil liability insurer.

Conclusion:

In light of the accelerating digital transformations of the modern era, artificial intelligence (AI) has emerged as one of the most significant legal challenges facing traditional legal frameworks - particularly in the field of intellectual property rights, which historically evolved to protect creative outputs

[1] Fairgrieve, D., & Gjølberg, M., Op.cit, p. 104.

[2] Bertolini, A., "Robots as products: The case for a realistic analysis of robotic applications and liability rules", Law, Innovation and Technology, vol. 5, no. 2, 2022, p 220.

[3] Fairgrieve, D., & Gjølberg, M., "Liability for AI and other emerging digital technologies", in Palmerini, E. & Stradella, E. (Eds.), Law and Technology: The Challenge of Regulating Technological Development, Springer, 2020, p100.

[4] Leenes, R., Palmerini, E., Koops, B. J., Bertolini, A., Salvini, P., & Lucivero, F., Op.cit, p 30.

[5] Pagallo, U, Op.cit, p 235.

[6] Bantekas, I., & Hodgkinson, T., Artificial Intelligence and Legal Responsibility: New Frameworks and Liabilities, Oxford University Press, 2021, p. 118.

of human origin. This research has revealed a clear gap between the advanced technological reality and the current legal systems, highlighting the urgent need for legislative intervention to close this gap and to strike a balance between legal protection and technological innovation.

The study has led to several key findings, which may be summarized as follows:

- Traditional legal frameworks have proven inadequate in addressing the protection of works generated by AI systems, especially where such creations are produced without direct human intervention.
- The absence of legal personality for AI remains a fundamental obstacle to recognizing its entitlement to autonomous intellectual property rights, despite its demonstrated creative and technical capabilities.
- The fragmentation of existing protective regimes (e.g., copyright, patents, trademarks) complicates the task of establishing a unified legal framework for complex AI-generated outputs that may embody elements of several types of intellectual property.
- Some jurisdictions, particularly within the European Union, have begun to explore the concept of electronic legal personality for AI systems, at least in part, primarily through the development of the "responsible human proxy" doctrine.
- The traditional concept of “innovation” as a prerequisite for legal protection is in urgent need of reconsideration in light of the technical and algorithmic nature of AI-generated works.
- Existing civil liability doctrines, particularly those based on “custodianship” or “vicarious responsibility,” are ill-suited to capture the unique nature of harm caused by autonomous AI systems, thereby necessitating more flexible and innovative legal solutions.

In light of the foregoing analysis, this study puts forward the following suggestions, which stem from the conclusions reached during the course of our research.

- The development of a dedicated legislative framework - or a specialized annex within existing intellectual property statutes - to regulate the protection of AI-generated works, with clearly defined criteria for eligibility and legal scope.
- Considering the partial or limited recognition of legal personality for certain forms of AI, especially those capable of independent decision-making and autonomous creative activity.
- Adopting a clear legislative model for the “responsible human proxy”, whether it be the owner, operator, or manufacturer, to determine legal liability for violations of intellectual property rights by AI systems.
- Revisiting the definition of “innovation”, shifting from a subjective, personality-based standard to an objective standard based on technical effort and functional originality.
- Encouraging legislators in Arab jurisdictions to draw from comparative legal experiences, particularly the evolving European model, to avoid potential regulatory voids in this vital and rapidly evolving field.
- Integrating AI-related legal issues into legal education and academic research, to ensure that future generations of legal professionals are equipped to address the legal implications of digital transformation effectively and insightfully.

Protecting intellectual property rights in the age of artificial intelligence is no longer merely a technical or regulatory issue - it has become a fundamental legal and philosophical challenge, requiring a reexamination of long-standing legal doctrines and the adoption of novel regulatory frameworks. Achieving digital justice in this context demands more than legislative reform; it calls for a paradigm shift in the legal community’s understanding of innovation and authorship, one that

embraces adaptability, foresight, and equity in navigating the complexities of a rapidly evolving digital era.

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