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Patent Protection for Artificial Intelligence: Contemporary Legal Challenges and Regulatory Perspectives

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Abstract: The rapid advancement of artificial intelligence (AI) technologies has created significant legal challenges within the framework of intellectual property law, particularly regarding the adequacy of patent protection for AI applications. Traditional patent systems were originally designed to regulate inventions created by human inventors, which has raised uncertainty concerning the legal status of AI-related innovations and their compliance with patentability requirements. This research examines the extent to which existing patent provisions can provide effective legal protection for artificial intelligence applications under Iraqi law in comparison with selected comparative legal systems. The study seeks to answer several questions, including whether AI applications may qualify as patentable inventions, whether traditional patent conditions remain sufficient to address AI technologies, and what legal implications arise from granting patent protection to such applications. The research adopts a doctrinal legal methodology based on descriptive, analytical, and comparative approaches. It relies on primary legal sources, including legislation, judicial decisions, and international agreements, as well as secondary academic sources on artificial intelligence and patent law. The study finds that although traditional patent rules face challenges in accommodating AI technologies, patent law remains one of the most appropriate legal mechanisms for protecting AI applications, particularly when they satisfy the requirements of novelty, inventive step, and industrial applicability. The research further concludes that current Iraqi patent legislation requires legislative reform to address the unique characteristics of AI technologies and to establish more flexible legal standards capable of responding to rapid technological development. The academic contribution of this study lies in clarifying the relationship between AI applications and patent protection and in proposing legal approaches that balance technological innovation with effective intellectual property protection.

Keywords: Artificial Intelligence; Intellectual Property Law; Patent Protection; Regulatory Framework; Technological Innovation.

INTRODUCTION

Artificial intelligence (AI) has become one of the most influential technological developments of the twenty-first century, transforming industrial, medical, commercial, and scientific sectors. [1]AI systems are increasingly capable of generating technical solutions, optimizing industrial processes, and contributing to research and development activities that human inventors traditionally performed.[2] Recent studies indicate that advances in AI have enabled machines to autonomously generate innovative outputs, thereby challenging the traditional assumptions upon which patent law has historically been based.[3] Consequently, intellectual property law, particularly patent law, faces significant challenges in determining whether AI-related innovations qualify for legal protection and whether existing patentability requirements remain adequate in the era of intelligent technologies.[4]

Patent protection has long been regarded as one of the principal legal mechanisms for encouraging innovation and promoting technological and economic development. However, the emergence of AI-generated inventions has sparked complex legal debates over inventorship, ownership, and the applicability of traditional patentability requirements, such as novelty, inventive step, and industrial applicability. Contemporary scholarship suggests that AI technologies are increasingly blurring the distinction between human and machine creativity, raising fundamental questions about the legal foundations of patent systems.[5]

The existing literature presents divergent perspectives regarding the patentability of AI-generated inventions. Some scholars argue that patent protection should remain available where there is meaningful human contribution to the inventive process, regardless of the use of AI as a

[1] Sukindar et al., 'Legal Innovation in Religious Courts: The Potential Utilization of Artificial Intelligence (AI) in Resolving Contemporary Cases', *MILRev: Metro Islamic Law Review* 3, no. 2 (December 2024): 388–410, https://doi.org/10.32332/milrev.v3i2.8199.

[2] Engkos Kosasih, Mohammad Rindu Fajar Islamy, and Rizzaldy Satria Wiwaha, 'Artificial Intelligence in the Era of Society 5.0: Compromising Technological Innovation Through theWasathiyyah Approach within the Framework of Islamic Law', *Al-Istinbath: Jurnal Hukum Islam* 9, no. 2 (September 2024): 551–572, https://doi.org/10.29240/jhi.v9i2.9596.

[3] CHUCHU LUO and ZHE DAI, 'Can Artificial Intelligence-Generated Inventions Be Protected by Patent Law?', *Biotechnology Law Report* 45, no. 2 (April 2026): 102–120, https://doi.org/10.1177/0730031X261430482.

[4] Disfa Lidian Handayani, 'Hukum Ekonomi Syariah: Tantangan Dan Peluang Dalam Pengembangan Inovasi Instrumen Keuangan Syariah', *Al-Manahij: Jurnal Kajian Hukum Islam* 9, no. 2 (2015): 335–346, https://doi.org/10.24090/mnh.v9i2.506.

[5] Ali Mazhar, Mohammad Zare, and Marjan Veysi, 'Examining the Challenges of Intellectual Property in AI-Generated Productions', arXiv:2605.26590, preprint, arXiv, 26 May 2026, https://doi.org/10.48550/arXiv.2605.26590.

technological tool.[6] Others contend that AI-generated inventions expose significant limitations in current patent frameworks because patent laws were originally designed on the assumption that inventors are natural persons. [78]These debates have become increasingly visible in administrative and judicial practice, particularly in jurisdictions such as the United States, the United Kingdom, and the European Union, where patent authorities have generally maintained the requirement of human inventorship despite the growing role of AI in innovation.[910]

Despite the growing international literature on AI and patent law, a significant gap persists in applying these debates within the Iraqi legal framework. Most existing studies focus on international, European, or American perspectives, while limited attention has been devoted to examining whether the Iraqi Patents and Industrial Models Law No. 65 of 1970, as amended, can provide effective protection for AI-related inventions. Furthermore, previous research has largely focused on theoretical discussions of inventorship and ownership, without comprehensively evaluating the adequacy of traditional patentability requirements when applied to AI applications under Iraqi law.

Accordingly, this study seeks to answer the following research questions: (1) Can artificial intelligence applications qualify as patentable inventions under Iraqi patent law? (2) Are the traditional requirements of novelty, inventive step, and industrial applicability sufficient to accommodate AI-related innovations? (3) What legal challenges arise from applying existing patent provisions to artificial intelligence technologies? Furthermore, (4) Is legislative reform necessary to ensure effective patent protection for AI applications?

The study aims to evaluate the suitability of patent protection for artificial intelligence applications within the Iraqi legal system through a comparative legal analysis. It further seeks to identify the principal legal challenges associated with AI-related inventions and propose legal approaches capable of balancing

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[6] LUO and DAI, 'Can Artificial Intelligence-Generated Inventions Be Protected by Patent Law?'

[7] Abdul Hadi et al., 'Undang-Undang Informasi Dan Transaksi Elektronik Dalam Konteks Maqasid Syari'ah', *Al-Manahij: Jurnal Kajian Hukum Islam* 14, no. 2 (December 2020): 211–224, https://doi.org/10.24090/mnh.v14i2.3582.

[8] Nashwa Ahmed Mohamed, Munira Mohamad Salem Rahma, and Mohamed Al Hemairy, 'Challenges and Prospects in Granting Patent Rights to AI-Generated Inventions: A Global Legal Study with Special Reference to the UAE', *Humanities and Social Sciences Communications* 12, no. 1 (November 2025): 1851, https://doi.org/10.1057/s41599-025-06121-y.

[9] Blake Brittain, 'US Patent Office Issues New Guidelines for AI-Assisted Inventions', Government, *Reuters*, 26 November 2025, https://www.reuters.com/legal/government/us-patent-office-issues-new-guidelines-ai-assisted-inventions-2025-11-26/.

[10] Ali Sati et al., 'The Digital Transformation of Tafsir and Its Implications for Islamic Legal Derivation in the Contemporary Era', *MILRev: Metro Islamic Law Review* 4, no. 1 (June 2025): 389–415, https://doi.org/10.32332/milrev.v4i1.10425.

technological innovation with effective intellectual property protection. The significance of this research lies in its contribution to contemporary legal scholarship by addressing an emerging issue that remains insufficiently explored in Iraqi legal studies while offering recommendations that may assist policymakers in developing a more adaptive patent framework for the era of artificial intelligence.

METHOD

This research adopts a doctrinal legal methodology, drawing on descriptive, analytical, and comparative approaches. The study primarily examines the legal protection of artificial intelligence applications within the framework of patent law, with particular focus on the Iraqi Patents and Industrial Models Law No. 65 of 1970 as amended, in comparison with relevant Egyptian legal provisions and selected international legal practices. The descriptive approach is used to explain the concept of artificial intelligence, the nature of patent rights, and the legal requirements for granting patent protection, including novelty, inventive step, and industrial applicability. The analytical approach is employed to examine the adequacy of existing patent rules for addressing the legal challenges posed by AI technologies and to analyze the legal implications of AI-related inventions. In addition, the comparative approach is utilized to identify similarities and differences between Iraqi legislation and comparative legal systems regarding the protection of AI applications.

The research relies on both primary and secondary sources of data. Primary sources include national legislation, international intellectual property agreements, judicial decisions, and official legal documents. Secondary sources include academic books, journal articles, legal commentaries, conference papers, and recent scholarly studies on artificial intelligence and patent law. The method of analysis is based on legal interpretation and the critical examination of legislative texts and judicial positions to determine the extent to which traditional patent rules can accommodate modern AI technologies. The study also evaluates contemporary legal opinions and doctrinal debates concerning inventorship, innovation, and the legal status of artificial intelligence within intellectual property systems.

RESULTS AND DISCUSSION

Applications definition: Artificial intelligence in the field of invention

The growing interest in artificial intelligence across academic research and practical applications reflects its profound technological capabilities, rapid expansion, and increasing significance in contemporary society. AI has far-reaching implications for social, economic, medical, and military sectors, while also contributing substantially to economic growth and national competitiveness. Given its dynamic and evolving nature, no single universally accepted definition of artificial intelligence has yet emerged. From both technical and legal perspectives, it is therefore essential to first examine the various applications of artificial intelligence within the context of

invention before exploring how the legal concept of invention applies to AI-generated innovations.[11]

Artificial intelligence (AI) is generally understood as the science and technology of developing machines capable of performing tasks that are typically associated with human intelligence.[12] Over time, scholars have proposed various definitions, many of which emphasize AI as a field of advanced computer science that enables systems to emulate human cognitive abilities. These capabilities include learning from experience, reasoning, drawing inferences, solving problems, and adapting to situations that were not explicitly anticipated during programming. Such characteristics distinguish AI from conventional computer systems that operate solely on predefined instructions.[13]

From this perspective, AI encompasses computer systems, software, and intelligent machines that are designed to simulate aspects of human thinking and decision-making. As a branch of computer science, AI focuses on developing algorithms and symbolic reasoning techniques that enable computers to perform tasks requiring human-like intelligence, such as perception, language processing, decision-making, and problem-solving. Rather than relying solely on numerical computations, AI systems integrate knowledge representation, logical reasoning, and machine learning to address complex, dynamic challenges across a wide range of applications.[14]

Most legislations have not provided a specific definition of artificial intelligence (AI). This is largely because AI is a relatively new and rapidly evolving field whose forms, characteristics, and applications continue to change as technological developments unfold across different countries. In addition, many legal scholars argue that creating highly detailed technical definitions is not always the primary role of legislators. As a result, establishing a fixed legal definition of AI is difficult, since a definition that is appropriate today may no longer reflect future technological developments. To provide a broader understanding, the World Intellectual Property Organization defined AI in 2019 as "a discipline of computer science aimed at developing machines and systems capable of performing tasks perceived as requiring human intelligence, with or without limited human intervention." In that context, AI generally refers to narrow AI, namely technologies and applications designed to

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[11] Muhammad Azam et al., 'Contemporary Trade Governance and Cross-Border Data Flows: A Comparative Study of Sharīʿah Principles and International Legal Frameworks', *MILRev: Metro Islamic Law Review* 5, no. 1 (May 2026): 686–721, https://doi.org/10.32332/milrev.v5i1.13387.

[12] Ghassan Adhab Atiyah et al., 'Legitimacy of Smart Contracts from the Perspective of Islamic Law: A Case Study of Blockchain Transactions', *Al-Istinbath: Jurnal Hukum Islam* 9, no. 1 (May 2024): 155–192, https://doi.org/10.29240/jhi.v9i1.8726.

[13] Ahmed, 'Management Applications of Artificial Intelligence in Administrative Decision-Making.'

[14] D. Adel Abdel Nour, *Introduction to the World of Artificial Intelligence Pdf* (Saudi Arabia: King Abdulaziz City for Science and Technology (KACST), 2005), https://www.noor-book.com/en/ebook- pdf.

perform specific tasks, while machine learning and deep learning are considered subsets of AI.[15]

In practice, AI applications consist of electronic systems and software that operate through algorithms capable of learning, predicting, reasoning, and acquiring knowledge in ways that resemble certain aspects of human behavior. As a branch of computer science, AI enables machines to perform both physical and cognitive tasks that are similar to activities normally carried out by humans in everyday life, such as recognizing patterns, making decisions, and solving problems.[16] From this perspective, some legal scholars argue that AI applications can be viewed as innovative digital products that may qualify for patent protection when they meet the legal requirements of an invention. However, the existing definitions of AI are generally more technical than legal. Most studies discuss AI as a technological phenomenon without clearly linking AI applications to the legal concept of invention, including the conditions and consequences of patent protection. Consequently, the debate over the scope of protection remains unresolved. In general, the discussion tends to revolve around two broad perspectives: first, AI-related outputs as intellectual creations connected to their creators, and second, AI-based products as technical and industrial results produced through human thought, effort, and creativity, regardless of the extent to which those products are personally connected to their creators.

Approaching the Concept of Invention in Artificial Intelligence Applications

The legal status of artificial intelligence (AI) applications cannot be fully understood without first examining the concept of an invention, which underlies patent protection. In general, an invention is understood as the creation of a new product, process, or technical solution developed through research, experimentation, and human ingenuity. It represents the core subject matter of patent law because it embodies an original idea that introduces a novel technological contribution capable of solving a specific technical problem. Accordingly, an invention may take the form of a new product, a manufacturing

[15] Abdel Hamid Al-Menshawi, *Protection of Intellectual Property: Copyright, Neighboring Rights, and Censorship Provisions on Artistic Works*, 1st ed (Alexandria: Dar Al-Jami'ah Al-Jadidah, 2018), https://www.neelwafurat.com/itempage.aspx?id=egb150617-5161459&search=books.

[16] WIPO, *Revised Issues Paper on Intellectual Property Policy and Artificial Intelligence*, WIPO/IP/AI/2/GE/20/1 REV (Geneva: World Intellectual Property Organization (WIPO), 2020), https://www.wipo.int/edocs/mdocs/mdocs/en/wipo_ip_ai_2_ge_20/wipo_ip_ai_2_ge_20_1_rev.pdf?utm_source=chatgpt.com.

process, an improvement to an existing product, or an enhancement of an established production method. [17]

Despite the central role of the concept of invention in patent law, many national legislations refrain from providing a comprehensive legal definition. The Egyptian Intellectual Property Law, for example, does not explicitly define the term "invention." By contrast, the Iraqi Patents and Industrial Designs Law defines an invention in Article 3 of Order No. 81 of 2004 as *"any creative idea developed by the inventor in any technical field and related to a product or manufacturing process that practically solves a specific problem."* Although this definition recognizes the technical nature of inventions, it has been criticized for being both overly broad and conceptually incomplete. It emphasizes problem-solving without expressly requiring the essential patentability criteria of novelty, inventive step, and industrial applicability. Furthermore, it does not sufficiently emphasize that the primary legal purpose of an invention is to qualify for patent protection, a defining characteristic of patent law.[18]

These limitations become even more apparent when AI-generated innovations are examined. Artificial intelligence systems are increasingly capable of generating technical solutions, optimizing industrial processes, designing products, and supporting scientific discovery. However, their outputs do not always fit neatly within conventional legal definitions of invention that were originally developed for human creators. Consequently, applying traditional patent concepts to AI innovations requires a broader interpretation of what constitutes an invention while preserving the fundamental principles of patent law.[19]

From this perspective, AI applications may be understood as innovative digital technologies that generate technical solutions through computational intelligence. Although AI operates through algorithms, machine learning models, and data-driven processes, its outputs often exhibit characteristics comparable to those of conventional technological inventions. Therefore, AI-related inventions may be conceptually defined as creative technical solutions embodied in intelligent digital products, computational methods, or technological processes that demonstrate novelty, involve an inventive step, possess industrial applicability, and provide practical solutions to real-world technical problems. Such a definition bridges the gap between traditional patent doctrine and

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[17] Khaled Aqeel. Al-Aqeel, 'Legal Protection of Patents and Industrial Designs', Available at Books and Publications Library, Riyadh: Naif Arab University for Security Sciences, 2004, https://futureuniversity.com/library/index.php?

[18] Ajja Al-Jilali, *Intellectual Property: Its Concept, Nature, and Divisions: A Comparative Study*, 1st ed (Beirut, Lebanon: Zain Legal Publications, 2015).

[19] Iraq, Patent and Industrial Designs Law No. 65 of 1970 (as Amended), § art. 1(6).

contemporary technological innovation while remaining consistent with internationally recognized patentability standards.[20]

The legal protection of AI applications under patent law depends not only on whether they satisfy the substantive requirements of patentability but also on identifying who is legally entitled to seek patent protection. Patent rights are granted through an administrative process in which the competent governmental authority issues an exclusive legal title that enables the patent holder to exploit the protected invention for a specified period. This exclusive right includes the authority to manufacture, use, license, market, or otherwise commercially exploit the patented invention while preventing unauthorized third parties from doing so during the period of protection. [21]

Internationally, the World Intellectual Property Organization (WIPO) defines a patent as an exclusive right granted for an invention that provides a new product, process, or technical solution to a particular problem. Although national patent systems differ in procedural details, they generally require that every invention satisfy three universally recognized substantive requirements: novelty, inventive step (non-obviousness), and industrial applicability. These requirements apply equally to AI-related inventions whenever they are claimed as patentable subject matter.[22] The legal entitlement to file a patent application also follows the general principles of patent law. Under the Iraqi Patents and Industrial Designs Law, both natural and legal persons are permitted to submit patent applications. This approach reflects the influence of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), which recognizes broader categories of applicants than earlier domestic legislation. [23]

Similarly, the Egyptian Intellectual Property Protection Law provides that a patent application may be submitted by the inventor or by any person who has legally acquired the inventor's rights. In both legal systems, ownership of the patent ultimately belongs either to the inventor or to the individual or legal entity that has lawfully obtained ownership through assignment, employment, or other

[20] Fawziya Naboush, *The Legal System of Patent Protection* (Sultan Qaboos Academy for Police Sciences Library; Nizwa, Oman: Arab Studies Library, 2020), https://futureuniversity.com/library/index.php?

[21] Egypt. Law No. 82 of 2002 on the Protection of Intellectual Property Rights, § art. 6 (2002).

[22] Saeed Saad Abd Al-Salam, *Expropriation of Intellectual Property for Public Benefit: Patents According to Law No. 82 of 2002 Concerning Intellectual Property*, 1st ed (Cairo, Egypt: Dar Al-Nahda Al-Arabiya, 2003).

[23] 'Manual of Forms for Inventions or Utility Models Applications, Egypt, WIPO Lex', accessed 20 May 2026, https://www.wipo.int/wipolex/en/legislation/details/8412.

https://doi.org/10.66325/nusantaralaw.v5i2.322

legally recognized mechanisms. [24] Iraqi legislation also expressly defines an inventor as "the person who creates the invention," whereas Egyptian legislation does not provide a statutory definition of the inventor despite recognizing the inventor's legal rights. This distinction becomes increasingly significant in the context of AI because contemporary AI systems can generate technical outputs without possessing legal personality. Under current patent law, AI cannot independently hold legal rights or submit patent applications. Consequently, any patent application involving AI-generated innovations must be filed by a natural or legal person who is legally recognized as the inventor or the owner of the invention, such as the developer, employer, assignee, or other rights holder, depending on the applicable legal framework.[25]

Accordingly, the current legal framework does not recognize AI itself as a patent applicant or patent owner. Instead, AI applications that satisfy the substantive requirements of patentability may receive legal protection only through applications submitted by legally recognized persons before the competent patent office. This approach preserves the traditional principles of patent law while allowing contemporary AI-assisted innovations to benefit from existing intellectual property protection mechanisms. At the same time, it highlights the growing need for future legal reforms capable of addressing increasingly autonomous forms of AI innovation without undermining the fundamental objectives of the patent system.[26]

The Subject-Matter Scope of Patent Protection for Artificial Intelligence

The patentability of an invention depends primarily on its subject matter. To qualify for patent protection, an invention must satisfy three fundamental requirements: novelty, inventive step (non-obviousness), and industrial applicability**.** These criteria form the cornerstone of patent law and determine whether an innovation deserves legal protection. Without fulfilling these requirements, an innovation cannot be recognized as a patentable invention.

Within this framework, artificial intelligence (AI) applications may be regarded as inventions when they embody a creative technical solution that addresses a specific problem or introduces a technological advancement capable of industrial application. Although AI systems operate through algorithms, data

[24] Ahmad Mustafa Al-Dabousi Al-Sayed, 'The Extent to Which Artificial Intelligence May Be Granted Patent Rights for Its Innovations: Can Artificial Intelligence Be Considered an Inventor? According to the Provisions of UAE Law', *Journal of Dubai Judicial Institute*, 2312-5799, vol. 9, no. 13 (2021): 83–103.

[25] Adnan Hashim Jawad Al-Sharoufi, 'The Impact of the TRIPS Agreement on Iraqi Patent Law: A Comparative Analytical Study', *Risalat Al-Huquq Journal* (iraq), 2011.

[26] Iraq,Patent and Industrial Designs Law No. 65 of 1970, § art. 16, accessed 20 May 2026, https://www.wipo.int/wipolex/en/legislation/details/10343?utm_source=chatgpt.com.

processing, and computational learning, their outputs may constitute technical innovations that generate practical value across various industrial sectors. Consequently, AI-related inventions should be assessed under the same substantive patentability requirements as conventional inventions, while accounting for the unique characteristics of AI technologies.

The Iraqi Patents and Industrial Designs Law No. 65 of 1970, as amended, establishes the conditions that must be satisfied before a patent may be granted. Article 2 provides that an invention must: (1) be industrially applicable; (2) be novel and involve an inventive step; and (3) relate to a new industrial product, a new industrial process, or a new application of an existing industrial process. Once these requirements are fulfilled, the inventor may submit a patent application to the competent Patent Office. The authority then examines whether the invention satisfies the statutory requirements and whether it falls within any of the categories of subject matter excluded from patent protection under Article 3 of the Law.[27]

As part of the application process, the inventor must also disclose sufficient information about the invention to enable its examination and public understanding. In return for this disclosure, the patent holder receives an exclusive right to exploit the invention for a specified period. This exclusive right includes the authority to manufacture, use, license, market, or otherwise commercially exploit the invention, while preventing unauthorized third parties from doing so without permission. In addition to these economic rights, patent law also recognizes the inventor's moral interest in being acknowledged as the creator of the invention.

One of the most debated issues in AI concerns the legal status of computer software. Computer programs consist of a series of instructions that direct a computer to process data and perform designated functions. Although software requires a physical medium, such as a computer, storage device, or cloud-based infrastructure, the program itself is generally regarded as an intangible intellectual creation rather than a physical invention. This distinction has generated considerable debate regarding whether software should be protected under patent law or copyright law.

The prevailing approach in both international and national legal systems is to exclude computer programs as such from patent protection and instead protect them through copyright law as literary works. The rationale is that software, in its abstract form, represents intellectual expression rather than a technical invention with industrial applicability. Egyptian legislation adopts this

[27] Egypt. Law No. 82 of 2002 on the Protection of Intellectual Property Rights, § art. 1 (2002).

approach by expressly excluding computer programs from patentable subject matter under Article 2 of the Intellectual Property Law. Similarly, Iraqi law protects computer programs under the Copyright Protection Law No. 3 of 1971, as amended by Order No. 83 of 2004, which classifies both source code and object code as literary works entitled to copyright protection. This legal classification creates challenges when AI innovations are embodied primarily in software, as it becomes difficult to determine whether they should be protected under patent law, copyright law, or both.[28]

Another important issue concerns the distinction between an original invention and a modified invention. Iraqi patent law recognizes that technological innovations often evolve through improvements, modifications, or additions to existing inventions. Article 15 of the Patents and Industrial Designs Law permits the holder of an existing patent to obtain an additional patent for improvements or modifications, provided the prescribed legal requirements are satisfied. The additional patent remains valid only for the duration of the original patent and is cancelled if the original patent is revoked. Furthermore, third parties may also obtain patents for modifications or improvements to existing inventions, although neither the original patent holder nor the holder of the improvement patent may commercially exploit the other's invention without mutual authorization.[29]

This distinction is particularly relevant to AI technologies, as AI systems are inherently dynamic and continually evolve through software updates, algorithmic improvements, expanded datasets, and enhanced computational capabilities. Unlike many conventional inventions, AI applications are rarely static after their initial development. Instead, they undergo continuous refinement that may significantly improve their technical performance while retaining the core characteristics of the original system. Consequently, determining whether an updated AI system constitutes a new invention or merely an improvement to an existing patented invention presents a significant legal challenge.[30]

The issue becomes especially important when assessing the novelty requirement. If an AI application has already been patented, subsequent developments—such as improvements to learning algorithms, modifications to

[28] Egypt. Law No. 82 of 2002 on the Protection of Intellectual Property Rights, § art. 10 (2002).

[29] Iraq. Patent and Industrial Designs Law No. 65 of 1970 (as Amended), § art. 12 (1970).

[30] Munawar Munawar, 'The Legality of Smart Contract in the Perspectives of Indonesian Law and Islamic Law', *Al-Istinbath: Jurnal Hukum Islam* 7, no. 1 May (May 2022): 265–86, https://doi.org/10.29240/jhi.v7i1.4140.

the system architecture, or the integration of additional technical features—may qualify as independent inventions or be treated as patentable improvements under the applicable legal framework. Resolving this question requires careful consideration of whether the modification introduces a genuinely new technical contribution that satisfies the requirements of novelty, inventive step, and industrial applicability. As discussed in the following sections, this issue has become a central debate in contemporary patent scholarship on AI-generated innovations and the appropriate scope of legal protection.

Table 1. Comparative Legal Treatment of Artificial Intelligence Applications under Patent Law

Legal Issue	Iraqi Patent Law No. 65 of 1970 (as amended)	Egyptian Intellectual Property Law No. 82 of 2002	International and Comparative Practice (WIPO, EPO, United States)	Implications for AI Applications
Definition of Invention	Defined as a creative idea leading to a practical solution in a technical field.	No explicit statutory definition; emphasis placed on patentability requirements.	Generally understood as a technical solution to a technical problem.	AI applications may qualify if they produce a technical solution rather than merely an abstract idea.
Eligible Applicant	Natural and legal persons may submit patent applications.	Patent applications may be submitted by the inventor or successor in title.	Most jurisdictions permit inventors or assignees to file.	Ownership of AI-related inventions remains linked to human or legal entities.
Inventorship	An inventor is the person who creates an invention.	Inventorship implicitly refers to a human inventor.	AI systems are not currently recognized as inventors in major jurisdictions.	AI-generated inventions require identification of a human inventor or owner.
Novelty Requirement	Required under Article 2 and clarified by Article 4 regarding prior	Required under Article 3; invention must not have been previously	Universal patentability requirement.	Difficult to assess where AI systems generate outputs using

	use and disclosure.	disclosed or patented.		extensive prior data and existing knowledge.
Inventive Step Requirement	Invention must contribute an innovative step beyond existing knowledge.	An invention must involve a non-obvious inventive contribution.	Evaluated according to the "person skilled in the art" standard.	Traditional standards may need to be adapted when AI significantly contributes to the inventive process.
Industrial Applicability	An invention must be capable of industrial application.	Industrial applicability is a mandatory requirement.	Recognized globally as a core patentability criterion.	AI applications may qualify if they produce practical technical or industrial outcomes.
Patentability of Software	Computer programs are generally protected under copyright law rather than patent law.	Software is generally excluded unless linked to a technical contribution.	EPO and U.S. practice allow patents where software produces a technical effect.	Patent protection may extend to AI applications integrated with technical systems or industrial processes.
Scope of Patent Protection	Covers products, manufacturing methods, and new industrial applications.	Covers products and processes satisfying statutory requirements.	Similar protection exists in most patent systems.	AI technologies may be patentable when embodied in a technical product or process.
Excluded Subject Matter	Discoveries, abstract ideas, and non-industrial subject matter are excluded.	Similar exclusions apply.	Abstract algorithms and mathematical methods are generally excluded.	Pure AI algorithms are usually not patentable unless they demonstrate a technical application.

Legislative Adaptation to AI	No specific provisions addressing AI-generated inventions.	No specific provisions addressing AI-generated inventions.	Ongoing international debate and policy development.	Legislative reform is needed to provide greater legal certainty for AI innovation.

Source: Prepared by the authors based on Iraqi Patent and Industrial Designs Law No. 65 of 1970 (as amended), Egyptian Intellectual Property Law No. 82 of 2002, WIPO publications on Artificial Intelligence and Intellectual Property, European Patent Office (EPO) Guidelines, and comparative patent law jurisprudence.

Patent Protection for Artificial Intelligence Applications: Jurisprudential and Judicial Perspectives

The rapid advancement of artificial intelligence (AI) has transformed the innovation landscape, prompting renewed debate over the suitability of existing intellectual property regimes to protect AI-related inventions. As AI technologies increasingly generate technical solutions with significant commercial and industrial value, scholars, legislators, and courts have sought to determine whether these innovations should be protected under patent law. This debate reflects not only the growing economic importance of AI but also the need to balance technological innovation with the fundamental principles of patent protection.[31]

From a jurisprudential perspective, considerable attention has been devoted to examining whether AI applications—particularly software-based innovations—should fall within the scope of patent law. Traditionally, many legal systems have distinguished computer software from patentable inventions by treating software primarily as a form of literary work protected under copyright law. However, the rapid evolution of AI has challenged this conventional approach. Unlike ordinary software, AI applications often produce technical solutions, optimize industrial processes, and enable autonomous decision-making, characteristics that more closely resemble technological inventions than creative literary expressions.[32]

Consequently, many legal scholars argue that AI applications should be evaluated based on their technical contributions rather than their software form.

[31] Sabri Hamad Khater, *The Extent of Adapting Traditional Legal Rules in Confronting Information: A Comparative Study* (Cairo, Egypt: Dar Al-Kutub Al-Qanuniyyah, 2014).

[32] Mohamed Mohamed Al-Qutub Musaad Saeed, 'The Role of Intellectual Property Rules in Facing the Challenges of Artificial Intelligence: A Comparative Analytical Legal Study', *Journal of Legal and Economic Research (Mansoura).* (Egypt), 2021, https://doi.org/10.21608/mjle.2021.175396.

This objective approach focuses on whether an AI application produces a novel technical solution capable of industrial application, rather than on the fact that it is implemented through computer code. Such reasoning reflects the broader shift from protecting software as intellectual expression toward recognizing AI systems as industrial technologies capable of generating patentable innovations.

Supporters of this approach emphasize that AI applications combine advanced programming techniques with technical knowledge to create products, manufacturing methods, and industrial processes that solve practical problems. In many cases, AI systems constitute new technological solutions or significantly improve existing industrial methods. Consequently, proponents argue that if an AI application satisfies the traditional patentability requirements of novelty, inventive step, and industrial applicability, there is no legal justification for excluding it solely because it is implemented through software. Granting patent protection would not only encourage technological innovation but would also provide stronger legal safeguards against unauthorized commercial exploitation than those available under copyright law.

This position has gained increasing support within both academic literature and patent practice. Several commentators point to developments in comparative patent law, particularly in Anglo-American legal systems, where software has been interpreted more flexibly than in many civil law jurisdictions. Because software is frequently an integral component of industrial equipment and technological processes, it is increasingly viewed as an industrial asset rather than merely as intellectual property. The widespread use of software licensing terminology, which originates from patent law concepts, further illustrates the gradual convergence between software protection and industrial property rights.

Judicial developments have also contributed significantly to this evolving legal perspective. The United States has played a particularly influential role in expanding the patentability of software-related inventions. American courts have recognized that computer-implemented inventions may qualify for patent protection when they provide concrete technical solutions rather than merely performing abstract calculations. One landmark example is the United States Supreme Court's decision in *Diamond v. Diehr* (1981), which held that a manufacturing process incorporating a computer program could be patented because the invention, viewed as a whole, produced a technical industrial result rather than merely implementing a mathematical algorithm.

European patent law has adopted a more cautious but increasingly pragmatic approach. Article 52 of the European Patent Convention excludes "computer programs as such" from patentability. Nevertheless, European patent practice has gradually recognized that computer-implemented inventions may receive patent protection when they produce a technical effect beyond the

normal operation of a computer. This principle was further reflected in the European Commission's 2002 Proposal for a Directive on the Patentability of Computer-Implemented Inventions, which emphasized that software should not be excluded automatically if it contributes to solving a technical problem. Likewise, decisions of the Paris Court of Appeal have confirmed that the use of a computer program within a technical process does not, by itself, prevent an invention from qualifying for patent protection. [33]

These legislative and judicial developments demonstrate an emerging international consensus that the legal assessment of AI applications should focus on their technical contribution rather than their digital form. Instead of asking whether an invention consists of software, patent authorities increasingly examine whether the claimed invention provides a genuine technological solution capable of industrial application. Despite this growing acceptance, the patentability of AI applications remains controversial because of the unique characteristics of AI technologies. Patent law traditionally requires every invention to satisfy three fundamental requirements: novelty, inventive step, and industrial applicability. While these standards have long been applied to conventional inventions, their application to AI-generated innovations raises new conceptual and practical challenges.

The requirement of novelty is particularly complex. Patent law generally requires that an invention must not have been publicly disclosed, previously patented, or otherwise form part of the existing state of the art before the filing date. Iraqi and Egyptian patent legislation both adopt this principle by excluding inventions that have already been publicly used, published, or patented. However, AI technologies evolve continuously through algorithmic improvements, software updates, retraining with new datasets, and modifications to system architecture. Unlike traditional mechanical inventions, AI systems rarely remain static after their initial creation. As a result, determining whether a modified AI system constitutes a genuinely new invention or merely an improvement to an existing technology presents significant legal difficulties. [34]

Another challenge concerns the inventive step requirement. Traditionally, patent law evaluates inventive step by asking whether the invention would have been obvious to a person skilled in the relevant technical field. Applying this standard to AI technologies, however, is increasingly problematic.

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[33] Hassan Abd Al-Basit Jumai'i, *Computer Software Contracts: A Comparative Study.*, 1998th edn (Cairo, Egypt: Dar Al-Nahda Al-Arabiya, n.d.).

[34] Apipuddin Apipuddin et al., 'Integrating Electronic Information and Transaction Law (UU ITE) and Islamic Criminal Law: Addressing Malware-Based Data Theft', *Al-Ahkam: Jurnal Ilmu Syari'ah Dan Hukum* 9, no. 2 (December 2024): 154–70, https://doi.org/10.22515/alahkam.v9i2.10269.

AI systems are capable of processing vast quantities of information, identifying hidden patterns, and generating technical solutions beyond the capabilities of ordinary human experts. Consequently, relying exclusively on the conventional "person skilled in the art" standard may no longer provide an adequate benchmark for evaluating AI-assisted innovation. [35]

Critics of software patentability argue that these conceptual difficulties justify excluding AI applications from patent protection. They contend that software remains an intangible intellectual creation rather than a physical technological invention, making it difficult to satisfy the novelty and inventive step requirements for patentability. Furthermore, software developers often prefer to keep algorithms confidential rather than disclose them publicly through the patent system. Given the relatively short commercial life cycle of many software products, the lengthy patent examination process may also reduce the practical value of patent protection.[36]

Some scholars further argue that software development is inherently cumulative. Computer programs are typically built upon pre-existing programming languages, algorithms, libraries, and development frameworks. Consequently, identifying the precise stage at which genuine novelty arises is considerably more difficult than for traditional mechanical inventions. They also question whether conventional patent examination methods can adequately evaluate AI technologies whose capabilities evolve through continuous learning rather than static engineering design.[37]

In contrast, a growing body of scholarship argues that these challenges should not prevent AI applications from receiving patent protection. Instead, existing patent standards should be interpreted considering AI's technological characteristics. According to this view, AI applications can produce entirely new industrial methods, autonomous technical systems, and innovative digital products that clearly satisfy the underlying objectives of patent law. Their technical contribution should therefore be assessed based on the functional improvements they provide rather than the software architecture through which they are implemented. [38]

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[35] Abdul Rahman Jamil Mahmoud Hussein, 'Legal Protection of Computer Software: A Comparative Study' (Master's thesis, Faculty of Graduate Studies, An-Najah National University, 2008).

[36] Kazem Hamdan Sadkhan Al-Bazouni, *The Impact of Artificial Intelligence on the Theory of Rights.*, 1st ed (Beirut, Lebanon: Al-Mu'assasa Al-Haditha lil-Kitab (Modern Book Foundation), 2023), https://www.neelwafurat.com/itempage.aspx?id=lbb387955-385212&search=books.

[37] Iraq. Patent and Industrial Designs Law No. 65 of 1970 (as Amended), § art. 2 (1970).

[38] Wajdi Shafik, *Encyclopedia of Intellectual Property Law* (Egypt: Egypt Publications and Legal Software (EgyPress), 2010).

Supporters further argue that software cannot be separated from the hardware systems it controls. AI applications function as integrated components of intelligent machines, industrial equipment, medical devices, autonomous vehicles, and other technological systems. Accordingly, the software should be evaluated alongside the technical process it enables, rather than in isolation. From this perspective, the invention lies not in the software code itself but in the technical solution generated by the interaction between software and hardware.[39]

This reasoning also influences the interpretation of novelty and inventive step. Rather than examining only the originality of software code, some scholars propose evaluating the mathematical models, computational architecture, learning algorithms, and technical functions that enable AI systems to solve previously unsolved problems. Under this approach, an AI invention may satisfy the novelty requirement when it introduces a genuinely new technical architecture or computational methodology, even if certain programming components are based on previously known techniques. [40]

Similarly, the assessment of inventive step should consider the complexity of AI technologies rather than relying solely on the traditional hypothetical skilled person.[41] Several commentators suggest that patent examination should increasingly evaluate the originality of AI algorithms, learning models, and computational structures as objective indicators of technological advancement. Such an approach would better reflect the unique nature of AI innovation while remaining consistent with the fundamental objectives of patent law. [42]

Overall, the contemporary debate demonstrates that AI technologies challenge traditional patent doctrine without rendering it obsolete. Instead, they require a more flexible interpretation of existing patentability standards that recognizes the distinctive characteristics of intelligent digital systems. Although important conceptual and practical challenges remain, both comparative jurisprudence and judicial practice increasingly support the view that AI

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[39] Naim Ahmad Naim Shniar, *Legal Protection of Patent in Light of Intellectual Property Law: A Comparative Study with Islamic Jurisprudence* (Egypt: Dar Al-Jami'ah Al-Jadidah, 2010), https://www.noor-book.com/book/review/368921.

[40] Mohammad Mousa Khalaf, 'Protection of Computer Software between Patent Law and Copyright: A Comparative Study with the Legislation Applied in Palestine', *Al-Mufakkir Journal* 11, no. 1 (February 2016): 53–70.

[41] Muhammad Azam et al., 'AI-Driven Sharia Governance in Islamic Digital Payment Systems: Developing a Contemporary Islamic Law Framework for Ethical and Regulatory Compliance', *Nusantara: Journal of Law Studies* 5, no. 2 (July 2026): 849–880, https://doi.org/10.66325/nusantaralaw.v5i2.339.

[42] Egypt. Law No. 82 of 2002 on the Protection of Intellectual Property Rights, § art. 1 (2002).

applications should be eligible for patent protection whenever they provide genuine technical solutions, satisfy the requirements of novelty, inventive step, and industrial applicability, and contribute meaningfully to technological progress. This evolving approach enables patent law to continue fulfilling its central objective of encouraging innovation while adapting to the realities of the digital era. [43]

Protecting Artificial Intelligence Applications under the Rules of Tort Liability

In addition to patent protection, artificial intelligence (AI) applications may also be protected through the general principles of tort liability when unauthorized acts cause harm to the patent holder. Tort liability arises from the breach of a legal duty not to cause harm to others and provides a legal basis for claiming compensation when patent rights are infringed. In the context of AI-related inventions, applying tort law requires establishing three essential elements: damage, wrongful conduct (fault), and a causal relationship between the wrongful act and the resulting damage**.**

The first element is damage, which constitutes the cornerstone of tort liability. Damage refers to an injury suffered by a person in relation to a legally protected right or legitimate interest. Without actual damage, no claim for compensation can arise. To be legally compensable, the damage must be direct, certain, and personal. It may consist of present harm or future harm that is reasonably certain to occur, but it cannot be merely speculative. Moreover, the damage must affect a legal right or a legitimate interest belonging to the injured party. Accordingly, the holder of a patent for an AI invention is entitled to seek compensation whenever unauthorized use of the patented invention infringes upon the exclusive rights granted under patent law.[44]

In the digital environment, the nature of damage resulting from AI-related inventions is often more complex than that associated with conventional technologies. Damage may occur directly to the AI system, including its software, algorithms, databases, and other digital components. Alternatively, AI applications may serve as instruments that inflict harm on another person's financial or commercial interests. In the first situation, the damage affects the AI system's technological infrastructure, whereas in the second, the injury primarily

[43] Doaa Hamed Mohamed Abdulrahman, 'The Impact of Artificial Intelligence Techniques on the Provisions of Intellectual Property Laws in Force (Patent Law as a Model)', sect. 2, *Journal of Sharia and Law,* 36 (January 2021): 1750–809.

[44] Abdul Majid Al-Hakim, Abdul Baqi Al-Bakri, and Mohammed Taha Al-Bashir, *Al-Wajeez Fi Nazariyat Al-Iltizam Fi Al-Qanun Al-Madani Al-Iraqi, Part One [The Concise Guide to the Theory of Obligations in Iraqi Civil Law*, 1st ed (Iraq: Dar Al-Sanhouri for Legal and Political Sciences, 2015), https://www.neelwafurat.com/itempage.aspx?id=lbb280617-264855&search=books.

targets the economic rights of the patent owner or user rather than the technology itself.

Legal scholars differ regarding whether proof of actual damage is always required in cases involving infringement of digital intellectual property rights.[45] One view holds that the mere occurrence of unauthorized use or infringement is sufficient to establish liability because the violation itself constitutes a harm to the patent holder's exclusive rights. Another view holds that compensation should be awarded only after the plaintiff demonstrates actual damage resulting from the infringement. A more balanced position suggests that although the injured party should allege the existence of damage, the court should retain discretion to determine whether sufficient evidence establishes compensable harm under the circumstances of each case. The second element of tort liability is wrongful conduct, commonly expressed in civil law systems as fault or negligence. Fault arises when a person breaches a legal obligation through conduct that a reasonable person would have avoided under similar circumstances. In the field of AI inventions, wrongful conduct is frequently observed in commercial or industrial competition, particularly when competing businesses develop or market similar technologies.[46]

Patent infringement represents one of the clearest forms of wrongful conduct. It may involve manufacturing, using, reproducing, marketing, importing, selling, or offering for sale a patented AI application without the patent owner's authorization.[47] Infringement may also occur through unauthorized use of the patented manufacturing process, software architecture, technical design, or confidential industrial know-how associated with the AI invention. Such acts violate the exclusive rights granted by patent law and give rise to civil liability for the resulting damage. [48]

Comparative patent legislation generally recognizes several common forms of patent infringement, including the unauthorized exploitation of a patented invention, the manufacture or distribution of counterfeit products incorporating the patented technology, and fraudulent attempts to obtain patent protection over an invention belonging to another person. These forms of

[45] Nibrosu Rohid et al., 'Reconstructing the Legal Enforcement Framework for Digital Activism in an Era of Technological Disruption', *Nusantara: Journal of Law Studies* 5, no. 2 (2026): 881–901, https://doi.org/10.66325/nusantaralaw.v5i2.236.

[46] Taha Jabbar Saber, *Establishing Civil Liability for Unlawful Acts Based on the Element of Damage.* (Mosul: Mosul University Press, 1984).

[47] Mohammad Khabbab Taki, 'Artificial Intelligence in Bangladesh's Legal System: Pathways to Smart and Efficient Justice', *Nusantara: Journal of Law Studies* 5, no. 1 (March 2026): 252–68, https://doi.org/10.66325/nusantaralaw.v5i1.158.

[48] Egypt. Law No. 82 of 2002 on the Protection of Intellectual Property Rights, § art. 32.

infringement apply equally to AI-related inventions, whether the protected subject matter consists of software, algorithms, manufacturing processes, or integrated technological systems. [49] Although the Iraqi Patents and Industrial Designs Law No. 65 of 1970 originally specified various forms of patent infringement, subsequent amendments modified these provisions and no longer enumerate infringement acts in the same detailed manner. Nevertheless, the general principles of civil liability continue to provide an important legal basis for protecting patent holders against unauthorized exploitation of AI inventions.

The third essential element is the causal relationship between the wrongful conduct and the resulting damage. Liability arises only where the infringement directly causes the injury suffered by the patent holder. As in other civil claims, the burden of proving causation generally rests upon the injured party. Establishing this causal connection is particularly important where multiple events or actors contribute to the alleged damage, since the court must determine whether the defendant's conduct was the legal cause of the injury.[50] The requirement of causation also determines the extent of compensation. A single act of infringement may cause multiple forms of damage, including direct financial losses, lost commercial opportunities, reputational harm, and ongoing economic consequences. Courts must therefore distinguish between damages that are directly attributable to the infringement and those that are too remote or unrelated to justify compensation. The causal relationship may be rebutted if the defendant proves that the damage resulted from an independent external cause beyond his control, such as force majeure, an unforeseeable accident, the conduct of a third party, or the actions of the injured party. In such circumstances, the chain of causation is broken, and tort liability cannot be established.[51]

Determining causation is particularly challenging in disputes involving AI technologies. AI systems operate through complex interactions among software, algorithms, datasets, hardware components, cloud infrastructure, and autonomous decision-making processes.[52] Consequently, identifying the precise

[49] Alaa Hussein Ali, Wurood Khalid Mohameed, and Mahmood Shaker Alaloosh, 'Legal Challenges of Cyber Risk on Commercial Transactions', *Malaysian J. Syariah & L.* 13 (2025): 456.

[50] Agusmidah, Titik Triwulan Tutik, and Anna Maslova, 'Artificial Intelligence and Wage Justice in Indonesian Labour Law: Balancing Living Wage Standards and Corporate Capacity', *Nusantara: Journal of Law Studies* 5, no. 1 (April 2026): 436–52, https://doi.org/10.66325/nusantaralaw.v5i1.270.

[51] Dr Hassan Sami Alabady, 'Towards a Legal Framework for Civil Liability of Smart Robots in Jordanian Legislation', *International Journal of Cyber Criminology* 17, no. 1 (June 2023): 23–39.

[52] Saleem Asouli, 'Digital Administrative Policing and Its Role in Regulating Cyberspace: A Comparative Study between Jordan and Indonesia', *Al-Biruni Journal of Humanities and Social Sciences*, 30 June 2026, 28, https://doi.org/10.64440/BIRUNI/BIR0028.

source of damage often requires sophisticated technical analysis. Harm may arise from hidden software defects, algorithmic errors, cybersecurity breaches, system interactions, or multiple interconnected technological factors, making it considerably more difficult to establish a direct causal relationship than in conventional patent disputes.[53]

The application of tort liability to AI-related patent infringement also intersects with the law of unfair competition. Where unauthorized exploitation of a patented AI invention distorts fair market competition, the patent owner may bring an action based on unfair competition in addition to a patent infringement claim. While patent rights generally become enforceable only after a patent is formally granted, some legal scholars argue that unfair competition law may provide broader protection by safeguarding the inventor's legitimate commercial interests even when formal patent protection has not yet been obtained. Finally, unlike criminal liability, tort liability does not require proof that the defendant intentionally sought to cause harm. Compensation may be awarded whenever the infringement results from negligence, carelessness, or any other legally wrongful conduct that causes compensable damage. Consequently, the principles of tort liability complement patent law by providing an additional mechanism for protecting AI inventions and ensuring that patent holders receive appropriate compensation when their exclusive rights are unlawfully violated.

CONCLUSION

This study concludes that the rapid advancement of artificial intelligence (AI) has challenged the adequacy of conventional patent law, particularly with respect to the legal concepts of inventorship, novelty, inventive step, and industrial applicability. Nevertheless, the findings demonstrate that patent law remains a viable and effective mechanism for protecting AI applications, provided that these technologies produce genuine technical innovations capable of industrial application. Through a comparative analysis of Iraqi and selected international legal frameworks, the study shows that existing patent systems can accommodate AI-related inventions to a certain extent. However, significant legal uncertainties remain regarding software-based innovations and increasingly autonomous AI systems. The analysis further reveals that the Iraqi Patents and Industrial Models Law No. 65 of 1970, as amended, has not fully adapted to the technological complexity of AI, highlighting the need for legislative reform that reflects the evolving nature of intelligent technologies while preserving the fundamental principles of patent protection. This research contributes to the growing

[53] Mahmood Alaloosh, Govar Majed Ahmad, and Lara Adel Jabbar, 'Adapting Iraqi Law to Smart Contracts: A Comparative Analysis Incorporating Islamic Law Principles and Consumer Protection in the Contemporary Digital Era', *MILRev: Metro Islamic Law Review* 5, no. 1 (February 2026): 210–46, https://doi.org/10.32332/milrev.v5i1.13031.

body of scholarship on artificial intelligence and intellectual property by proposing a more adaptive interpretation of patent law that balances innovation incentives with legal certainty. Rather than treating AI applications as fundamentally incompatible with existing patent frameworks, the study demonstrates that a flexible and technology-oriented approach can extend patent protection without undermining the core objectives of intellectual property law. However, the research is limited to patent protection and does not examine other complementary legal regimes, such as copyright, trade secrets, or data governance, which also play important roles in regulating AI innovation.

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AUTHOR CONTRIBUTIONS STATEMENT

Sarmad Dalaf Hanoosh conceived and designed the study, developed the research framework, and supervised the overall project. Ahmed Faez Abed contributed to the research methodology, data collection, and formal analysis. Souria Mazouz participated in the interpretation of findings, validation of the results, and critical evaluation of the legal framework. Aqeel Sarhan Fayyadh contributed to the investigation, literature review, and drafting of the original manuscript. Neamah Rashid Salih was responsible for reviewing and editing the manuscript, ensuring its academic quality and consistency, and coordinating the final revision prior to submission. All authors contributed to the interpretation of the findings, critically revised the manuscript for important intellectual content, approved the final version for publication, and agreed to be accountable for all aspects of the work, ensuring its accuracy, integrity, and scholarly quality.

AI USAGE STATEMENT

The authors used artificial intelligence (AI)-assisted tools solely to improve the clarity, grammar, readability, and academic writing quality of the manuscript during the drafting and editing process. AI tools were not used to formulate the research questions, design the methodology, collect or analyze data, interpret the findings, or

generate the scientific conclusions presented in this article. All intellectual contributions, including the conceptualization, legal analysis, interpretation of results, and conclusions, are the sole responsibility of the authors. The authors carefully reviewed, verified, and approved the final version of the manuscript and accept full responsibility for its accuracy, originality, and academic integrity.

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest regarding the publication of this manuscript. This research was conducted independently without any financial, commercial, institutional, or personal relationships that could have influenced the study design, data collection, analysis, interpretation of the findings, or the preparation of the manuscript. The authors confirm that they have no competing interests that could have affected the objectivity, integrity, or validity of the research. All authors have reviewed and approved the final version of the manuscript and accept full responsibility for its content and academic integrity.

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