AI and IP: What does the future hold?

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Artificial intelligence is rapidly transforming innovation, but its intersection with intellectual property rights raises complex legal, ethical and judicial challenges. **Pravin Anand, Alvin Antony** and **Ajai Garg** explore how current IP systems must evolve to address AI-generated works, with global examples illustrating the urgent need for an adaptive, harmonized framework.

At the intersection of innovation and regulation, artificial intelligence and intellectual property rights stand as crucial pillars shaping our technological future. The rapid advancement of AI, both discriminative (systems that categorize existing data) and generative (systems that create new content), presents unprecedented challenges and opportunities for the global intellectual property framework. Discriminative AI excels at pattern recognition, powering applications from medical diagnostics to fraud detection, while generative AI creates novel content across text, images and code, exemplified by platforms like ChatGPT and DALL-E. These technological marvels raise fundamental questions about ownership, attribution and protection in an ecosystem where machines increasingly replicate human creative and inventive processes.

The existing intellectual property infrastructure, developed for human creators and inventors, now faces evolutionary pressure by way of adapting to AI's capabilities. As legal territories worldwide grapple with novel challenges involving the interpretation of present IP systems to AI-generated works and AI-assisted inventions, stakeholders from technology companies to policymakers are navigating uncharted regulatory territory. The future relationship between AI and IP will fundamentally shape how innovation is incentivized, protected and shared across borders in our increasingly AI-infused economy. It will be prudent to add that AI presents a US$15 trillion global opportunity and needs IP systems to adopt to realize the same.

Why IPRs are crucial for business on AI

Both the development and use of AI technologies have the potential to be hindered by several identified challenges when it comes to IPRs. For example: How can we efficiently protect investment through IP protection within a company developing new AI technologies? How can a company's training data set and pre-trained model be protected? What kind of IPRs will be created, and how will ownership of such IP be organized and monetized? How can a company address the different jurisdictions of IPRs, and how could this impact innovation? IP ownership issues with regard to generative AI systems that can produce novel images, music or text in response to user prompts.

To understand the complexity of the present IPR regimes globally on AI, it is important to understand the process for the evolution of an AI outcome. Raw data is typically collected from large groups of sources. When combined with a specific type of algorithm, this raw data can help computers create inventions without human involvement. This may also often involve various intermediatory inventive steps like removing noise from raw data or evolving trained models that are then processed in AI engines to create an outcome which is new, novel and has industrial application. The patent system that we have today was developed with a focus on providing tangibility to creativity by humans, but in AI systems, the end outcome can be by machines, not humans. Considering that the basic mantra of the patent system is to promote human innovation for the benefit of humans, there is a need to respond appropriately to these new challenges. From a copyright law standpoint, the present challenge is with regard to generative AI, mainly from the training data point, much of which is scraped from the internet.

IPRs also facilitate the crucial balance between openness and protection. Strategic IP management allows companies to participate in collaborative innovation ecosystems while maintaining control over their core technologies. This balanced approach enables knowledge sharing through selective open-source releases and academic publications while preserving commercial advantages through strategic protection of key innovations. Open innovation models provide a unique opportunity for the global south to participate equitability in AI evolution.

How IPRs are currently supporting the AI business around the world

The current global IP framework, while still evolving, provides essential protections across the AI development lifecycle, from algorithmic innovations and training methodologies to deployment mechanisms and generated outputs, provided the laws are interpreted appropriately. In Ukraine, a groundbreaking approach has emerged through Law No. 2811-IX, which establishes a sui generis right (a unique or specific legal right) specifically for computer program-generated 'non-original' subject matter. This innovative legal mechanism vests rights in "authors of the computer program, their heirs, persons to whom the authors or their heirs transferred economic rights to the computer program or the lawful users of the computer program." The Ukrainian IP Office has already registered several works incorporating AI-generated content protected under this framework, demonstrating a practical implementation of specialized IP rights for AI outputs.

In the United States, the Copyright Office has undertaken a comprehensive examination of AI and copyright through a series of reports. Its January 2025 report concluded that existing copyright laws protect original expressions in works created by human authors, even if those works were developed through AI-generated tools or include AI-generated material. This approach maintains the human authorship requirement while acknowledging the reality of AI-assisted creation. The Copyright Office has registered works containing AI-generated material, with copyright laws protecting human authors' contributions, establishing an evolving framework that balances innovation with traditional

copyright principles.

Patent protection similarly plays a critical role in the AI ecosystem, particularly for fundamental algorithms, training methodologies and hardware implementations. Companies globally are amassing substantial patent portfolios covering core AI technologies, creating valuable strategic assets. Meanwhile, trade secret protection has emerged as equally important for proprietary training datasets, optimization techniques and specialized algorithms that may not be suitable for patent disclosure. This was illustrated in the Neural Magic v. Meta Platforms case from the U.S., where sophisticated algorithms improving machine learning efficiency were protected as valuable trade secrets rather than through patent filings.

Courts worldwide are actively shaping the contours of IP protection for AI. The Hangzhou Internet Court in China found an AI platform liable for contributory copyright infringement when it allowed users to create models generating variations on recognizable Ultraman images without implementing necessary preventive measures. This ruling established an important precedent regarding platform liability while simultaneously acknowledging that images created by AI technology could, in theory, be covered by the fair use defence under certain conditions.

Challenges in the AI-IP landscape

The global landscape of AI and intellectual property rights is characterized by significant jurisdictional variations that create substantial challenges for developers and users. These differences manifest prominently in the treatment of AI-generated works. While Ukraine has implemented a sui generis protection framework, many jurisdictions maintain strict human authorship requirements, creating a fragmented international protection landscape. This jurisdictional inconsistency complicates cross-border AI deployment and commercialization strategies, potentially impeding global innovation.

Litigation has emerged as a defining feature of the AI-IP interface, with over 30 lawsuits filed against AI companies in U.S. federal courts alone, primarily alleging direct copyright infringement for unauthorized use of copyrighted works in AI model training. The Delhi High Court is similarly examining a high-profile case brought by news organization ANI against OpenAI, alleging copyright violations in training ChatGPT with news content. These cases centre on the critical question of whether AI training constitutes fair use, a question that remains judicially unresolved despite its fundamental importance to the industry's development. As an amicus curiae (a "friend of the court" who is not a party to a case but offers information or expertise relevant to the case) in the ANI case noted, there are serious concerns about the feasibility of developing large language models (LLMs) without access to copyrighted information.

International trade relations further complicate the effective deployment of IP protections for AI technologies. OpenAI's jurisdictional challenge in the Delhi High Court case, claiming its servers are

located outside India with no physical presence there, illustrates how territorial limitations of IP enforcement interact with the inherently borderless nature of AI deployment. Additionally, OpenAI argued that any deletion order from the Indian court might create legal contradictions with U.S. requirements to preserve training data for ongoing litigation, highlighting how cross-jurisdictional legal obligations can create regulatory quagmires.

The complexity of AI systems, often involving numerous contributors and components, creates substantial challenges in clearly identifying rights holders and appropriate compensation mechanisms. As AI systems become increasingly sophisticated and widely deployed, these attribution challenges will intensify, necessitating innovative legal frameworks that can accommodate technological realities while protecting legitimate creator interests.

A futuristic view: IPRs at the centre of the AI ecosystem

The future intellectual property landscape for artificial intelligence will likely evolve toward a nuanced, multi-layered protection framework that accommodates the unique characteristics of AI innovation. Patents will remain fundamental for protecting core algorithmic innovations and hardware implementations, particularly for specialized AI chips and novel training methodologies. However, the accelerating pace of AI development may necessitate modifications to patent examination procedures, potentially including AI-specific examination units with specialized expertise and adaptive protection terms that better align with AI's rapid innovation cycles.

Copyright protection will continue evolving to address AI-related challenges, potentially adopting elements of Ukraine's innovative sui generis approach for computer-generated works. This evolution might include specialized registration procedures for AI-assisted works that appropriately attribute contributions from both human and machine sources. The U.S. Copyright Office's current approach, requiring disclosure of AI-generated material while protecting human authorship contributions, provides a foundation for this development. Future copyright frameworks might introduce graduated protection levels based on the degree of human creative input, establishing a spectrum rather than a binary distinction.

Trade secrets and know-how will assume increasing strategic importance, particularly for proprietary training methodologies, dataset curation techniques and model optimization approaches that represent valuable competitive advantages. The Neural Magic case exemplifies this trend, where sophisticated algorithms enhancing machine learning efficiency were protected through trade secret mechanisms rather than public patent disclosures. This shift toward secrecy may prompt regulatory responses to balance innovation protection with knowledge dissemination, potentially including mandatory disclosure requirements for AI systems deployed in sensitive domains.

The fundamental question of whether AI can be considered an author or inventor will require a definitive resolution, with profound implications for the intellectual property ecosystem. While current

legal frameworks generally maintain human authorship requirements, technological advancement may eventually challenge this distinction's sustainability. Future legal frameworks might recognize limited forms of AI authorship under specific conditions, perhaps vesting rights in the entity responsible for the AI system while establishing appropriate compensation mechanisms for source material creators.

Effective IP protection for AI will necessitate international harmonization efforts addressing jurisdictional inconsistencies. The World Intellectual Property Organization (WIPO) Conversation on IP and AI represents an early step toward developing consensus principles, but more binding frameworks may ultimately emerge. These harmonization efforts must balance the interests of established technology companies with emerging innovators and address North-South divides in technological development capabilities.

Liability allocation frameworks for AI-generated outputs will become increasingly sophisticated, potentially establishing graduated responsibility systems based on deployment context, use case and supervision level. The Chinese court's nuanced approach in finding an AI platform liable for contributory infringement while acknowledging potential fair use defences for AI-generated images demonstrates early judicial consideration of these complex balancing considerations.

The convergence of AI with other emerging technologies, including blockchain for provenance tracking, advanced encryption for secure licensing and federated learning for privacy-preserving development, will create new opportunities for intellectual property management. These technological solutions may complement legal frameworks, enabling more nuanced rights management and appropriate compensation distribution across complex AI value chains.

As the U.S. Justice Department noted recently in its case against Google, AI development without appropriate competitive safeguards risks extending existing digital monopolies. Consequently, competition law will increasingly intersect with intellectual property protection for AI, necessitating careful balancing of innovation incentives with market access considerations. This intersection will shape how intellectual property rights are enforced and licensed in the AI domain, potentially including specialized compulsory licensing mechanisms for essential AI technologies.

Conclusion

The evolving relationship between artificial intelligence and intellectual property represents one of the most consequential legal challenges of our technological era. As AI capabilities continue advancing across both discriminative and generative applications, effective IP frameworks must balance innovation incentives with access considerations and creator rights with technological realities. The current global landscape, characterized by jurisdictional variations, emerging litigation and innovative approaches like Ukraine's sui generis protection, provides valuable insights into potential future directions. The ultimate resolution of key questions regarding AI authorship, training

data utilization, and cross-border protection will fundamentally shape how AI technologies develop and deploy globally, determining whether intellectual property serves as a catalyst or constraint in our increasingly AI-augmented world.