

INTELLECTUAL PROPERTY IN THE METAVERSE: RETHINKING PATENT LAW FOR VIRTUAL AND AI-GENERATED INNOVATIONS

by

Rashi Makhija

Abstract

The rapid expansion of the Metaverse—a vast, interconnected system of AI and blockchain technological innovations and 3D virtual spaces with real-time human interactions—has started to change human relations, work, and human creativity. However, India’s patent legislation has primarily focused on mechanical and tangible inventions, which ignores the pressing need to conceptualize legislation for virtual and AI inventions. This article considers innovations in the Metaverse in the context of India’s patent system, particularly how the phrase “*computer programs per se*” in the *Section 3(k)* of the Patents Act, 1970, and the global discourse on AI-driven inventorship intersects. This article refers to the notable Indian case *Ferid Allani v. Union of India* and the recent software patenting cases, the article analyzes how courts have begun to change the interpretation of “*technical effect*.” This article also argues for the need of Indian legislation to adapt for AI-guided inventions and the need to retain human agency. This paper proposes several pragmatic policy initiatives to for India, including the clarification of Section 3(k), the formation of patent examination AI and Metaverse focused examination cell, and fostering collaboration between courts and patent examiners to strengthen India’s patent policy in the digital age.

Introduction: Understanding the Metaverse with respect to Patents

There is one possible way metaverse apps can function is through the nexus of AR, VR, and the blockchain. The current users develop and trade digital objects, and AR VR users can purchase and trade real estate in the metaverse. The Virtual protagonists enact each of these functions and activities. The interactive VR interface, the spatial tracking and motion capture systems, the AI driven rendering, and the blockchain systems that verify digital ownership make the metaverse function seamlessly.

While most of these technologies can stand alone, some of them can give rise to meta patents for new AR VR metaverse systems. All these technologies may deliver patentable innovations and

inventions. Patents grant inventors a form of compensation for their creativity and exclusivity on their inventions for a limited time—up to 20 years. In absence of these legal mechanisms, potential Metaverse Developments Innovation Technologies may prove to be a good technological investment, but builders may not be willing to disclose new innovations. They may be reluctant to invest. Legislation and patent innovations, however, remain built on the recognizing of physical industrial products.

The Indian Patent Law Landscape: Section 3(k) Challenge

Section 3(k) of the Act, excludes “*a mathematical or business method or a computer program per se or algorithms*” from patentability.¹ This provision was intended to avoid preventing monopolization of abstract concepts within software. However, as Metaverse technology integrates hardware, software, and immersive interactivity, the difference between “*software*” and “*technical invention*” overlaps even more.

This was further expanded upon in the Guidelines for Examination of Computer Related Inventions where the India Patent Office (IPO) indicated that software can possibly be patentable if it produces a “*technical effect*” such as improved image processing or reduced network latency.² The 2025 revision to these guidelines addressed, more specifically, the need to assess technologies like AI, blockchain, and VR based on technological contribution for patentability.³

In the article published by *Ranjani Sundar* and *Kshitij Arora* state that “*technical effect*” principle brings India closer to the European approach which emphasizes the practical contribution of the invention.⁴ However, in contrast to the EU, India, and especially its courts, still applies Section 3(k) rigidly which may be stifling innovation within the Metaverse.

Landmark Judicial Interpretations

In this landmark case of *Ferid Allani v Union of India*,⁵ the Delhi High Court decided that inventions that included computer programs were patentable if they involved a “*technical*

¹ The Patents Act 1970, s 3(k) (India).

² Controller General of Patents, Guidelines for Examination of Computer Related Inventions (IPO, 2017).

³ Indian Patent Office, Revised CRI Guidelines (2025).

⁴ R. Sundar and K. Arora, ‘Revisiting the “Technical Effect” Test for Software Patents in India’ (2023) Journal of Intellectual Property Law & Practice (Oxford University Press).

⁵ Ferid Allani v. Union of India (2020) Delhi HC.

contribution.”. The case highlighted how patent law needs to keep pace with modern technologies in India, referring to the “technical effect” in the European patent office literature. The case is now one of the foundational cases for arguing that patents can be granted for inventions related to the Metaverse.

In the *BlackBerry 2024* case⁶, the Delhi High Court presented two competing decisions on patents for BlackBerry’s software. In one case, the judge defended the rejection of a software patent as algorithmic and non-technical. In the other, the judge allowed a similar patent arguing that there was a significant improvement in performance of the system.

The Indian judiciary’s comprehension of digital and virtual inventions is still a work in progress. The challenges posed by the Metaverse, especially those that work on AI and blockchain interoperations, further complicate this understanding.

AI and Inventorship in the Metaverse

AI technologies are capable of creating 3D models, drafting architectural blueprints, and even constructing the code for virtual interactions. This brings forth the vital legal question: Who is the inventor?

In Indian legislation, the “*inventor*” is a person, and so a machine cannot yet legally be recognized as an inventor, even if it is an autonomous invention contributor.⁷ This was the core question involving the global DABUS litigation, where an AI named DABUS was designated an inventor on patent applications in the UK, US, and EU and was rejected in all jurisdictions on the grounds that only humans could be recognized as legal inventors.⁸

Indian policies are beginning to take note. The NITI Aayog’s “*IndiaAI*” framework (2023) emphasizes human accountability in AI systems, suggesting that credit should be reserved for the developers or operators of the systems.⁹ Legal scholars, for example, *Fatma Dilara*¹⁰ note about “*hybrid models*” that record AI’s involvement, yet replace human inventors. This is also articulated

⁶ BlackBerry Ltd v. Controller of Patents (2024) Delhi HC (contrasting software patent rulings).

⁷ Patents Act 1970, ss 2(1)(y), 6.

⁸ Thaler v Comptroller-General of Patents [2023] UKSC 49.

⁹ NITI Aayog, *IndiaAI Report* (2023).

¹⁰ Fatma Dilara Isler Albayrak, ‘Artificial Intelligence and Patent Law’ in *Artificial Intelligence and the Law* (Taylor & Francis, 2024).

in the scholarly work of *P. H. Lim*¹¹ where the “*accountable human*” standard is proposed, and is used to ensure responsibility while recognizing technological collaboration.

While AI can aid the inventive process, the individual who conceptualizes, trains, or manages the AI system should be recognized as the inventor so that the patent can be assigned to an accountable entity, and patent ownership disputes can be avoided.

Criteria to Determine the Patentability of Innovations in the Metaverse

For inventions related to the Metaverse to be eligible for patent protection in India, the following simple, practical test can be applied. The invention must address a specific technical problem, for example, overcoming VR lag, quick rendering, or sensory feedback. There must be at least one individual or human who can be recognized as a creator or controller of the invention. Secondly, the invention must have some practical utility, even if it's in a virtual setting. Thirdly, the invention must be sufficiently different from existing technologies. And most Metaverse inventions incorporate user data or biometric information, so the *Digital Personal Data Protection Act* will govern its use.¹²

Enforcement in a Borderless World

Patents are territorial rights. An Indian patent is enforceable only within India. But in the Metaverse, the “place” where infringement occurs may not be physical—it could be on a server in another country or a virtual space accessible from everywhere.

This raises questions that if an Indian patent covers a VR technology and a foreign company uses it on its global platform, can Indian courts claim jurisdiction? Legal scholars like *N. Shemtov*¹³ and *R. Villegas Tovar*¹⁴ emphasize that cross-border enforcement of digital patents requires international cooperation through treaties such as the Patent Cooperation Treaty (PCT) and enhanced WIPO coordination.

¹¹ P H Lim, ‘Artificial Intelligence and Inventorship: Patently Much Ado in the Age of DABUS’ (2022) *Journal of Intellectual Property Law & Practice* 17(10).

¹² *Digital Personal Data Protection Act*, 2023 (India).

¹³ N Shemtov, *Concept of Inventorship in Inventions Involving AI Activity* (EPO Study, 2019).

¹⁴ R Villegas Tovar, ‘Addressing the Challenge of Artificial Intelligence and Inventorship’ (2025) *Springer AI and Society Journal*.

The WIPO Conversation on IP and Frontier Technologies explored similar concerns, urging countries to develop “*digital patent registries*” linked to blockchain to verify ownership and provenance.¹⁵ This approach could support transparent enforcement in virtual economies.

Scholarly Insights and Comparative Perspectives

There is a growing consensus within contemporary scholarship regarding the need for adaptable patent systems in relation to the Metaverse. For example, *Kale*¹⁶ discuss virtual inventions comprising AI, design, and software components which border the thresholds of patents and copyrights.

Correspondingly, some scholars argued that the complete exclusion of software patents could stall growth in the digital economies.¹⁷

Various scholars demonstrates a rising body of research advocating for the integration of AI and Metaverse technology to patent law.¹⁸ The proposal for the revision of national patent legislation to allow for “*AI-assisted inventorship*” as a legal term, stopping short of granting legal personhood to machines.¹⁹

All of this suggests that, while India may be taking a guarded approach to patents, it does need to adapt in order to be able to competitively defend Metaverse innovations.

Policy Recommendations for India

(a) Clarify Section 3(k)

Issuing an authoritative interpretation or amendment on the definition of a “technical effect” in the context of software-related inventions would help eliminate ambiguity for AI or VR application developers.²⁰

¹⁵ WIPO, Conversation on IP and Frontier Technologies: Metaverse and AI (2024).

¹⁶ A Kale et al, ‘Patents in the Metaverse: An Analysis of Scope and Challenges’ (2024) ResearchGate Preprint.

¹⁷ Lim (n 11); Albayrak (n 10).

¹⁸ M Chatterjee, ‘Artificial Intelligence and Patent Law: Emerging Trends in Digital Innovation’ (2024) SpringerLink Journal of Intellectual Property and Information Technology <https://link.springer.com/article/10.1007/s40319-024-01234> Accessed 1 November 2025.

¹⁹ A. Saravanan, AI Inventorship: Comparative Analysis, SSRN Working Paper (2024), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5053108.

²⁰ Law Commission of India, Reform of Software Patentability Provisions, Consultation Paper (2024).

(b) Recognize AI-Assisted Inventions

An acknowledgment AI-assisted inventions rule should be created. The inventorship should be in the hands of the human that programmed, guided, or operated the AI. This blend model innovation and accountability. It establish a dedicated Metaverse and AI Patent Trademark examiners in the Indian Patent Office should be trained in computer science and differentiated technologies such as AI, as well as blockchain technology, and assess applications in a consistent manner. The Cell for IPR Promotion and Management (CIPAM) has already emphasized examiner upskilling, and the creation of a dedicated Metaverse cell would further that initiative.²¹

(c) Use Blockchain for Proof of Ownership

Using blockchain-based registries for time stamping and verifying an invention will diminish disputes in digital and virtual products. The reports by NITI Aayog and MeitY on blockchain for governance suggest such systems are likely executable in India.²²

Capacity Building for Judiciary

The Judges and patent officers should complete ongoing training on advanced AI and VR technologies to ensure consistent adjudication. This training would help reduce inconsistencies like those in the BlackBerry rulings.²³

Ethical and Economic Dimensions of Multi-Disciplinary Legal Research

Reforming patent law for the Metaverse involves more than just changing the legal text; it requires consideration of the ethics and the economics of innovation. While overly broad patents can limit innovation in free virtual environments, too little protection can dissuade investment in research. As a developing digital economy, India needs to strike a balance. As noted, the innovation occurs best when inventors can disclose their ideas and are accountable for their ideas' consequences.

Policymakers should target responsible regulation to encourage innovation, protecting meaningful technological contributions while ensuring the Metaverse can be free and cooperative.

²¹ CIPAM Annual Report (2025).

²² Cell for IPR Promotion and Management (CIPAM), Annual Report (2025).

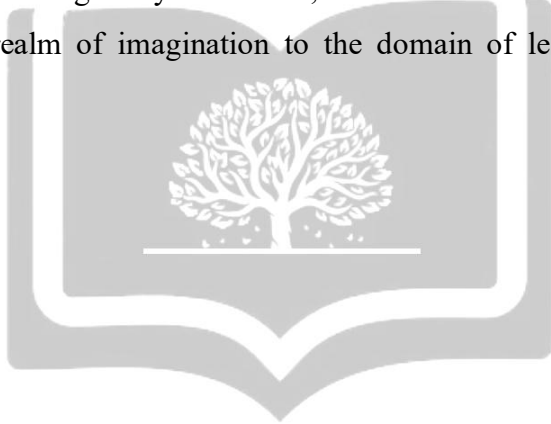
²³ OECD, *Cell for IPR Promotion and Management (CIPAM), Annual Report (2025)*. (2021); WIPO, *supra* note 15.

Conclusion

The Metaverse is bound to be the next big thing—the fusion of AI, VR, and blockchain will unlock virtual worlds and spaces with real-life value. For the digital frontiers, India's patent law will need to adjust, especially since the public interest must be preserved. India's patent law, initially designed for the mechanical inventions will now need to protect the digital frontiers.

Judicial interpretations show that Indian courts are open to evolution. But doctrinal ambiguity, as seen in some recent cases, must be resolved to bring clarity and consistency. So Section 3(k), recognition of AI assisted inventorship, and the development of specialized institutional construct will help India become a leader in governance of Metaverse innovation.

The message remains constant, the aim is not to treat machines as entities, but to compensate people for their technological ingenuity. Therefore, India must ensure that patent law transforms the Metaverse from the realm of imagination to the domain of legally sanctioned, equitable innovation.



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