A CRITICAL ANALYSIS OF TECHNICAL EFFECT OR TECHNICAL FICTION? RE-EVALUATING SECTION 3(K) OF THE PATENTS ACT, 1970 FOR AI-GENERATED INVENTIONS

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ABSTRACT

AI is far removed from research into the academic arena and is now actively involved in the creation of commercially viable, patentable inventions, which is straining long-standing patent law principles. Under Section 3(k) of the Patents Act, 1970, any invention which is a mathematical or business method, or a computer programme per se is not eligible for patent.Under Section 3(k) of the Patents Act, 1970, any invention that is a ‘mathematical method or business method', or is a ‘computer programme per se' is ineligible for patent in India. The provision was never intended to cover the specific case of an AI system identifying a technical problem and then suggesting a specific technical solution. The provision was created when software and algorithms were the primary issues in patent offices, and it was never intended to cover the unique position of an AI system identifying a technical problem and then suggesting a specific technical solution. The central question of this paper is whether it is meaningful to distinguish between a real technical effect and what a critic may label a technical fiction as a "skin deep" characterization of a largely non-technical product. This paper supports this claim by examining the words of Section 3(k) in the light of how analogous bodies (such as the United States, the United Kingdom, and the European Patent Office) have struggled with the problem of AI-generated inventions, as well as by engaging with existing scholarship in the field of AI and IP policy. The paper also argues that the Indian patent regime, lacking a viable "technical effect" requirement and requiring the inventor to be a natural person, is fraught with an absence of clarity and a risk of inhibiting innovation and investment in AI research. The paper ends with an interpretive multi-layer approach and specific legislative adjustments to bring Indian patent law into line with the realities of the Fourth Industrial Revolution without losing the spirit of the patent system.

Keywords: Section 3(k), Patents Act 1970, AI-Generated Inventions, Technical Effect, DABUS, Patent Eligibility, India.

1. INTRODUCTION

Patent law and innovation always have been and always will be in a state of creative tension. As history demonstrates, with each significant technology shift, whether it was steam power to pharmaceuticals, or semiconductor circuits to biotechnology, patent systems have had to answer a seemingly simple question: Is this what we wanted to patent? Today, artificial intelligence asks the same question and in India, the response is largely dependent on the meaning of Section 3(k) of the Patents Act, 1970[1].

However, Section 3(k) provides an exception to the definition of patentable invention for "mathematical or business method or a computer programme per se or algorithms. The history of the exclusion indicates that the focus of Parliament was to avoid the monopolisation of abstract ideas: steps of a mind, mathematical formulas, software code etc. that did not have any discernible impact on the physical world. In 1970, or even as the provision was significantly amended in 2002, Parliament could not have foreseen a time when an artificial intelligence system trained on millions of scientific publications would independently be able to design a novel molecule or recognise an unmet technical challenge in an existing industrial process, or invent a new structure for a container lid with better grip. They are not speculations, but the actual results of technologies like DABUS (Device for the Autonomous Bootstrapping of Unified Sentience)[2] which has led to landmark litigation in several jurisdictions[3].

The doctrinal challenge is serious. An AI generated invention is most often derived from processes which are, at one level of description, algorithmic and mathematical. The broad and literal interpretation of the statutory exclusion in Section 3(k) would effectively exclude from patent protection virtually all the output of an AI, as essentially anything produced by a computer programme per se or an algorithm would fall into this category. But this would result in practical and legal absurdities: If someone invents a practical and concrete machine that has a specific technical effect, and if that effect is created by the machine's mind, but not by a human mind, that invention should not be protected.

This is a field of law where there is still significant uncertainty, as illustrated by the

[1] Patents Act, No. 39 of 1970, § 3(k) (India)
[2] Ryan Abbott, The Reasonable Robot: Artificial Intelligence and the Law 89–96 (2020)
[3] Thaler v. Vidal, 43 F.4th 1207 (Fed. Cir. 2022); Thaler v. Comptroller-General of Patents, Designs & Trade Marks [2023] UKSC 49.

international picture. Data compiled by the World Intellectual Property Organization (WIPO)[4] shows that, as of 2024, over 160,000 patent applications relating to AI-assisted or AI-generated inventions had been filed worldwide, a growth rate of more than 800 percent since 10 years prior. As India has emerged as a leading technology development and development hub and is definitely moving towards becoming a research hub for AI, it has still not formulated a solid policy response to this trend. It creates a legal landscape where uncertainty, inconsistencies, and increasing misalignment between patent incentives and the way innovation takes place in AI-driven sectors are the norm.

There are five substantive parts to this paper. Part II examines the text, history and judicial understanding of Section 3(k). Part III reviews the development of the technical effect doctrine in similar jurisdictions. In Part IV, the author critically examines the ability of the current version of Section 3(k) to allow for AI-generated inventions to be patented without the need to either broaden the scope of the section to include abstract ideas or narrow it to exclude substantive technical inventions. Part V explores the wider policy implications, including the role of intellectual property incentives with relation to AI innovation. The conclusions and proposals for reform are provided in Part VI.

2. 3(K): TEXT, HISTORY, AND INTERPRETATION.3(K): TEXT, HISTORY, AND INTERPRETATION.

Patents Act, 1970, Section (3(k)) states that a mathematical or business method or a computer programme per se or algorithm shall not be considered to be an invention within the meaning of the Act[5]. The "by itself" or "in itself" ("per se") is the fulcrum that turns the whole provision. It suggests that a computer programme which has no additional function beyond executing mathematical or logical operations as such is not, and a computer programme which is not embedded in a technical process or technique but which produces a technical effect in addition to the natural interaction between the computer programme and the computer on which it is operated may not be.

This “per se” qualification was brought in by the Patents (Amendment) Act, 2002, which followed the European Patent Office's trend and an intention in Parliament to not exclude software-embedded inventions from IP protection. Indian patent offices and courts, however, have not come up with a well-established doctrine as in Europe, such as the “technical

[4] Data compiled by the World Intellectual Property Organization (WIPO)
[5] Patents Act, No. 39 of 1970, § 3(k) (India).

character" or "technical effect" tests, and the Manual of Patent Office Practice and Procedure does not provide any specific guidance on how to evaluate claims to computer-implemented processes[6].

The definitional clauses of the act make this even more confusing. Section 2(1)(j) states that "invention" is a new product or process of invention which has an inventive step and is capable of industrial application[7]. The meaning of "inventive step" is given in Section 2(1)(ja) [8]with respect to "a person skilled in the art", and the meaning of the "true and first inventor" is provided in Section 2(1)(y)[9] which presupposes that the "first inventor" is a natural person. Their provisions are based on the assumption that the cognitive work of an invention is done by a human being. However, the definitional framework of the Act starts to wobble when the mind conceiving the invention is not a human mind, but an AI system, as in the case of an AI that created the initial idea.

The use of Section 3(k) has been rather scarce in judicial decisions and has not yet been considered with respect to inventions created by AI. The most important judicial interpretations of the provision are made in the case of Ferid Allani vs Union of India (2019) [10]held by Delhi High Court. The Court found, among other reasons, that the 'per se' qualification had to be taken "seriously" and that a computer programme claim was not necessarily rendered invalid because it did more than just the 'normal physical interaction' between software and hardware. The Court explicitly referenced the European Patent Office (EPO)[11] 'purposive approach' and not a literalist one, to the exclusion. The endorsement of a "technical effect analysis" offers the best doctrinal basis for handling AI-generated inventions under existing law, although Ferid Allani did not discuss them.

3. THE COMPARATIVE LANDSCAPE: TECHNICAL EFFECT DOCTRINES AND AI INVENTORSHIP

3.1 The European Patent Office

The jurisprudence of the European Patent Office is the most advanced in the field of technical

[6] Office of the Controller General of Patents, Designs & Trade Marks, Manual of Patent Office Practice and Procedure (2019).
[7] Patents Act, No. 39 of 1970, § 2(1)(j) (India).
[8] Id. § 2(1)(ja)
[9] Id. § 2(1)(y).
[10] Ferid Allani v. Union of India, 2019 SCC OnLine Del 11867
[11] Id. ¶¶ 19–25

character in the case of computer-implemented inventions. Guidelines for Examination G-II 3.6[12] say that a computer-implemented invention is patentable if the invention achieves "technical effect" that is more than the normal physical interaction between the program and the computer. The EPO has been of the opinion that mathematical methods, such as those of AI and machine learning, can be patentable as long as they are used for a technical purpose that, for example, improves image recognition, control of a physical process or increases the efficiency of a medical diagnostic system. The EPO, however, does not allow an AI system to be declared an inventor, as is stipulated in Article 81 of the European Patent Convention[13], which provides that the inventor must be a natural person.

3.2 The United States

The Federal Circuit in Thaler v. Vidal (2022)[14] correctly interpreted the Patent Act as requiring the name of a natural person as the inventor, thus ruling that an AI system may not be named as an inventor under the Patent Act. In 2023, the Supreme Court refused to hear this case, meaning that the Federal Circuit's decision is final. The U.S. Patent and Trademark Office (PTO) later follows this lead by issuing guidance on its website that inventions created using AI can be patentable if they represent a “meaningful contribution” by a human inventor[15]. The question of whether that's a major human role when the AI has done all of the creative cognitive thinking has not been resolved.

3.3 The United Kingdom

In another case, Thaler v. Comptroller-General (2023)[16], the UK Supreme Court also held that the person who actually devised the invention must be the inventor, but for different reasons, ruling based on the requirement that an inventor be a person. The Court recognised the policy dilemma in its reasoning – that a law that does not allow a patent to be granted on an AI-generated invention could have a chilling effect on the incentives to create an AI system that generates an invention – but that Parliament was the body responsible for making any changes to the law, not the courts.

[12] European Patent Office, Guidelines for Examination in the European Patent Office, Part G-II, § 3.6 (2025).
[13] Convention on the Grant of European Patents art. 81, Oct. 5, 1973, 1065 U.N.T.S. 199.
[14] Thaler v. Vidal, 43 F.4th 1207 (Fed. Cir. 2022)
[15] U.S. Patent & Trademark Office, Inventorship Guidance for AI-Assisted Inventions, 89 Fed. Reg. 10043 (Feb. 13, 2024).
[16] Thaler v. Comptroller-General of Patents, Designs & Trade Marks [2023] UKSC 49.

3.4 Implications for India

Any jurisdiction aiming to foster innovation through the patent system with the help of artificial intelligence will face huge obstacles from the convergence of US, UK and EPO rights to regard the natural-person requirement for inventorship. As has been noted, there is an international consensus and there is a property rights vacuum for genuine autonomous inventions by AI: neither the AI can own the patent, nor there may be any human who can claim to have created the invention in any meaningful way. This issue has not yet been directly answered by the Indian Government and there is no legislative or judicial guidance and applicants and examiners are traversing this path without a map.

4. TECHNICAL EFFECT OR TECHNICAL FICTION? A CRITICAL ANALYSIS

4.1 The Characterisation Problem

The characterisation problem is at the heart of the analytical challenge Section 3(k) presents to AI-generated inventions, and it is the level of abstraction selected to describe the invention that will often determine whether it can be patented. At one level of description, an AI system that has discovered a novel drug molecule has carried out a sequence of mathematical operations on a high dimensional dataset. As presently interpreted, there is no principled basis for selecting one of these descriptions over another because of section 3(k).

There are analogous problems in copyright law, as noted by scholarship on IP and AI. Fischman-Afori's proposed "Substantial Recognizable Linkage" test for AI-generated art which centers on the linkage between the art product and other prior work that is protected by copyright may offer a precedent for patent law[17]: If an AI-generated invention is evaluated by considering it in relation to the prior art and the technical problem that it resolves, not by looking at the process in which it was created, then it may provide a blueprint for AI-generated art.

4.2 The "Per Se" Qualification and Its Limits

The inclusion of the ‘per se' qualification in Section 3(k) was designed to allow for software-integrated inventions that have a ‘real technical effect. However, in practice, Indian patent

[17] Orit Fischman-Afori, AI-Created Works and Copyright Law, 39 Cardozo Arts & Ent. L.J. 1, 24–30 (2021).

practice has not evolved a science to distinguish inventions that provide a technical benefit, and those that do not. The Manual of Patent Office Practice and Procedure mentions several factors, none of which is exclusive, such as whether the claimed invention has a technical effect; whether it is a technical process; and whether it has a direct technical connection with physical reality; but doesn't explain how any of these factors are to be given weight or applied where they all go in different directions.

This is especially relevant for AI generated inventions. Imagine a system powered by artificial intelligence which, given data gathered from sensors installed in the cooling system of an industrial turbine, is able to predict with high accuracy the failure of a bearing, and then to design a specific modification of the cooling system which will fix the failure mode. The process of identification will be mathematical operations on a set of numerical data. The proposed modification is one that can be made to the physical system. Whether this is a computer programme per se or an invention having a technical effect will depend entirely on the drafting of the claim and the way in which the examiner or tribunal sees the invention as having an inventive contribution (which is a task at present without any clear doctrinal guidance).

4.3 The Inventorship Lacuna

Assuming that the characterisation issue could be solved to everyone's satisfaction, there is a second and equally profound issue – who is the inventor of an AI-generated invention? Section 2(1)(y) of the Patents Act, 1970, defines the ‘true and first inventor’ by a presumption of a natural person, as noted above. This may leave an 'inventorship gap' – if the cognitive process is completed by an AI system, then it is possible that there might be no human that could reasonably claim to have invented it. The operator or developer of the AI system may not have contributed in a technical sense to the invention. To reduce it to a strict analysis, to name such a person as inventor would be a misrepresentation.

It has been highlighted by the DABUS litigation. The developer of the AI system, Stephen Thaler, said that he should be named as the assignee to the patent rights created by his AI, even if the AI was the real inventor[18]. The courts in all three jurisdictions rejected this argument not for any lack of merit as a policy matter, but because it did not align with the words in the statute

[18] Thaler v. Vidal, 43 F.4th 1207 (Fed. Cir. 2022)

at the time. The same issue arises with the Indian statutory text: the Act doesn't have a category for AI-generated inventions and none of the creative interpretations can add a category where Parliament has failed to provide it.

4.4 The Innovation Policy Dimension

The real consequences of this doctrinal confusion are serious. According to estimates by McKinsey Global Institute[19], global investment in AI research has reached over USD 91 billion in 2022 and is expected to reach more than USD 300 billion by 2030. Much of this funding goes towards applications in drug discovery, materials science, and process optimization in industry where patentability is a key factor in success and return on investment. A credible and robust AI patent ecosystem will be challenging to achieve in India if the local patent system is unable to effectively safeguard the results of AI-generated research.

There has been a good amount of scholarship on the issue of the benefits of stronger IP protection for innovation, with important and cautionary points to make regarding the relationship between the two. On the other hand, proponents of a broad AI patent regime argue that it would primarily benefit big tech firm with the manpower and capital necessary to develop and use cutting-edge AI systems, which could further cement the current dominance of the tech sector[20]. This worry is not groundless. Any modification of Section 3(k) should therefore be structured taking into account the distributional impacts, so that the benefits of patent protection are not accrued only to dominant firms.

Okediji's discussion on the general connection of digital trade, copyright and access to knowledge is complementary[21]. She has noted that the protection of IP rights in analogue economies often does not take into consideration the manner in which digital technologies redefine the concept of creation, distribution, and consumption. And, similarly, the same can be said of patent law in the era of AI a system built around the image of the man or woman working in isolation with materials and tools is poorly suited to an environment in which the most important inventions are likely to come from systems that have no legal personality, no subjective sense of having created, and no rights-holding ability.

[19] McKinsey Global Institute, The State of AI 2023 (2023).
[20] Mark A. Lemley & Bryan Casey, Fair Learning, 99 Tex. L. Rev. 743, 771–75 (2021).
[21] Ruth L. Okediji, Copyright and Access to Knowledge in the Digital Economy, 15 Minn. J.L. Sci. & Tech. 1 (2014).

5. POLICY IMPLICATIONS AND PROPOSALS FOR REFORM

5.1 A Statutory Technical Effect Standard

Most pressing is a clear, workable definition or rule of "technical effect" that would be applicable and uniform to patent examiners and patent reading tribunals. While the "per se" qualification in Section 3(k) does not state it expressly, there is an implication for such a test. The Guidelines issued by the EPO and the approach followed by the Delhi HC in Ferid Allani[22] should be followed by the Indian Patent Office in its examination guidelines, which must include at least three requirements: first, the effect must be observable and measurable in the physical world; second, the effect must be beyond the scope of normal physical interaction between the computer programme and the hardware on which it is executed; and third, the effect must have a direct causal relationship with the claimed solution to the technical problem. These criteria would offer a principled distinction between AI generated inventions that actually create something of a technical nature and ones that simply involve the mathematical manipulation of data for the sake of data.

5.2 A Framework for AI Inventorship

There is a need for a legislative solution to the invention of lacuna. The most defensible position, in line with the policy goals of the patent system, is to allow the human developer or operator of an AI system to claim as the inventor of AI-generated inventions so long as the human "made a 'qualifying contribution' to the inventive process. A qualifying contribution may encompass the design of the architecture of the AI system, the choice and curation of the training data, the specification of the technical problem that the AI was tasked with solving, or any other substantive interaction with the inventive process in excess of simply turning on a machine. This would keep the human-centred nature of the patent system and recognise the fact that we are entering an era where humans and machines work together to achieve invention.

Alternatively, as several commentators have suggested, and as the South African patent office has already tolerated in practice[23], a "category" of AI-generated inventions could be recognised as patentable, but under specific ownership rules, such as that the ownership of an AI-generated invention would be transferred to the entity that owns, or controls, the AI system. Asay's

[22] Ferid Allani v. Union of India, 2019 SCC OnLine Del 11867.
[23] Companies and Intellectual Property Commission (South Africa), Patent No. 2021/03242 (July 28, 2021).

analysis of market concentration in the AI industry makes the point of having patent rights held by a few large AI companies even more salient: this approach has the benefit of simplicity and transparency, but it introduces some difficult questions[24].

5.3 Cross-Sectoral Harmonisation

The approach to creating a response to AI inventorship in India cannot be done in isolation. As Gaur and Yadav have noted, the DABUS litigation has created a patchwork global situation where the exact same AI invention might be patentable in one country but not another[25]. The fragmentation introduces perverse incentives for "jurisdiction shopping" and also a great deal of legal uncertainty for companies that are active in several markets. India should participate actively in the current multilateral discussions on AI and intellectual property with WIPO[26] with a goal to formulate common ground principles that can be incorporated into domestic laws. Such a harmonised international approach would lower transaction costs, build legal certainty and contribute to ensuring that the benefits of the innovation created through AI are fairly shared among jurisdictions with varying economic maturity.

5.4 Consideration of the risk of monopolisation.

Any changes to Section 3(k) should be considered carefully, with the potential for monopoly power over outputs from and tools used to create AI in mind. Markovic's discussion of the access-to-justice implications of generative AI[27] offers a helpful analogy: an AI-powered legal tool available to only high-income parties is likely to add to, not decrease, the inequality of access to justice in the legal system; an AI-powered patent system open to only large technology companies is likely to add to, not decrease, the inequality of access to innovation in the innovation system. Potential measures could involve mandating compulsory licensing rights for public interest areas, limiting patentability of AI tools or processes, rather than specific inventions, and strengthening disclosure obligations to allow subsequent researchers to learn from and build on AI-enabled patented inventions.

[24] Clark D. Asay, Intellectual Property and Artificial Intelligence, 23 Stan. Tech. L. Rev. 1 (2020).
[25] Anubhav Gaur & Akanksha Yadav, DABUS and the Global Inventorship Debate, 14 J. Intell. Prop. L. & Prac. 551 (2024).
[26] World Intellectual Property Organization, WIPO Conversation on Intellectual Property and Artificial Intelligence (2025).
[27] Milan Markovic, Generative AI and Access to Justice, 72 Am. U. L. Rev. 1145 (2023).

6. CONCLUSION

The Patents Act 1970, section 3(k) was designed for a time when the distinction between a computer programme and a technical invention was still subject to debate, but could be identified. In an unexpected twist that the provision's creators could not have predicted, the rise of AI systems that can produce creative work independently has shaken that dividing line. In its current form, Section 3(k) poses a question[28], namely whether this invention is a computer programme per se, or is it a technical effect, but provides no interpretive tools to consistently and fairly answer the question in the context of AI-generated inventions.

The paper has said that the provision has failed not just technically, but structurally. These issues of characterisation, inventorship and a workable standard of 'technical effect' are not problems that can simply be solved by creative interpretation. They need legislative action – a statutory concept of technical effect, a system to determine who can be an AI's inventor, and interaction with the new international agreement on these issues[29].

Not to do so would be to leave disputes about these issues to be decided on a case-by-case basis by patent offices and courts, not guided by doctrinal rules. In practical terms, it is a refusal to give patent protection to a large body of commercially important inventions which can therefore be likened to a weakening of the incentive structures that are supposed to encourage investment in precisely the kind of innovative activity that India's development ambitions have in mind. The difference between technical effect and technical fiction is important and the patent law in India needs to have a principled approach to this difference.

Ultimately, the reconsideration of Section 3(k) on AI-created inventions is not a matter of statutory interpretation. It is an essential policy decision on India's policy on innovation, whose interests it is meant to protect, and what sort of law it needs to be.

[28] Patents Act, No. 39 of 1970, § 3(k) (India).
[29] World Intellectual Property Organization, WIPO AI Policy and Intellectual Property Report (2025).

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