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Bridging Innovation and Patent Law: Need for a Sui Generis Regime for Software Patents in India

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Abstract

The rapid advancement of Artificial Intelligence (AI) is transforming organisational practices, particularly within Strategic Human Resource Management (SHRM), in the evolving landscape of Industry 5.0. This study investigates the integration of AI into SHRM and examines its influence on human-centric sustainability perceptions within organizations. Unlike Industry 4.0, which emphasises automation and efficiency, Industry 5.0 prioritises human well-being, ethical considerations, and sustainable value creation alongside technological advancement. In this context, AI-driven HR practices such as talent acquisition, performance analytics, employee engagement, and decision support systems are increasingly reshaping workforce management. The study adopts an empirical approach to assess how AI-enabled HR systems affect employee perceptions of fairness, transparency, inclusivity, and long-term sustainability. It further explores the interplay between technological adoption and human-centric values, highlighting the need for balancing efficiency with ethical responsibility. The findings suggest that while AI integration enhances operational effectiveness and strategic decision-making, its impact on sustainability perceptions is significantly mediated by organisational culture, ethical frameworks, and employee trust. The research also identifies potential risks, including algorithmic bias, reduced human interaction, and resistance to technological change. By contributing to the emerging discourse on AI-driven SHRM in the Industry 5.0 era, this study underscores the importance of designing human-centric AI systems that align with sustainability goals. The paper offers theoretical and managerial implications for organisations aiming to achieve sustainable competitive advantage through responsible AI adoption.

Keywords: Artificial Intelligence (AI), Digital Transformation, Employee Perceptions, Industry 5.0, Human-Centric Sustainability, Strategic Human Resource Management (SHRM)

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1. Introduction

The exponential growth of software-driven technologies has fundamentally altered the nature of innovation in the twenty-first century. In India, however, patent law continues to regulate software through a statutory framework conceived for a pre-digital industrial era. Section 3(k) of the Patents Act, 1970, excludes "computer programme per se" from patentability, resulting in persistent uncertainty regarding the legal protection of software-based inventions. Although Indian courts have progressively interpreted this exclusion to permit patents for computer-related inventions demonstrating a technical effect or technical contribution, such judicial intervention remains fragmented and highly fact-specific. This article contends that the widening conflict between software innovation and the existing patent framework cannot be adequately resolved through interpretative techniques alone. It advances a principled argument in favour of a sui generis regime for software patents in India - one that reconciles innovation incentives with legal certainty while safeguarding public interest and competitive markets.

2. Innovation and Patent Law Divide in the Digital Age

Innovation and Patent law are designed to operate in a complementary manner. The innovation generates new technological solutions, while the patent law incentivises and protects them. However, in the digital economy, this alignment has fractured. In the present cyber age, the application and use of software have transitioned from a supplementary computational tool to the foundational infrastructure of modern innovation. AI, fintech, blockchain, telecommunications, smart manufacturing, and e-governance and many more are all software-centric domains, but the patent law in India continues to treat software with doctrinal caution.

The Indian Patents Act, 1970[1], particularly Section 3(k)[2], reflects a historical uncertainty towards abstract and algorithmic subject matter. While such caution was once justified to prevent monopolisation of ideas, its continued application has become increasingly problematic. As of this date, the software-driven innovation does not reside merely in abstract logic but manifests itself in tangible technical effects, industrial processes, and economic efficiencies. The statutory framework has remained passive, not evolving at the same pace.

Indian courts, however, have attempted to connect this growing divide by interpreting "computer programme per se" in a manner that preserves patentability for inventions exhibiting technical contribution. The judicial efforts remain a provisional measure, as they cannot substitute for a coherent legislative framework. Bridging the gap between innovation and patent law requires the adoption of a sui generis regime for software patents. This article contends that India must progress beyond fragmented

[1] https://www.indiacode.nic.in/bitstream/123456789/1392/1/A1970-39.pdf (accessed on 11 Jan 2026)
[2] Sec. 3 '(k) a mathematical or business method or a computer programme per se or algorithms;'

doctrinal developments and embrace a clear, coherent legislative framework.

3. Understanding Software Patents

The term "software" or "software patent" is not defined in Indian statutes, including Indian patent law. The Oxford Advanced Learner's Dictionary defines "software" as "the programs, etc. used to operate a computer," while the Cambridge Dictionary describes it as "the instructions that control what a computer does; computer programs." Hence, a software patent can be understood as protection for any novel technical solution implemented through a computer programme, emphasising the inventive function rather than the literal code. By focusing on the functional contribution of software, such as improved efficiency, enhanced security, or the automation of complex processes, patent protection can support the development of innovations that have tangible industrial and societal impact, rather than merely safeguarding mere lines of code. Viewed in this manner, software patents emerge as a strategic instrument to nurture innovation, secure competitive advantage, and strengthen India's position as a global hub for digital and technological development.

At present, Indian copyright law provides a foundational layer of protection for software by recognising computer programmes as literary works under Section 2(o)[3] read with Section 2(ffc)[4] of the Copyright Act, 1957[5]. This classification ensures legal protection for the literal expression of a computer programme, which prevents only in direct copying and unauthorised reproduction of software code.

But the copyright protection is inherently confined to expression only, leaving the underlying ideas, algorithms, technical logic, and functional methods largely outside its ambit. The copyright law cannot prevent the development of functionally equivalent software that achieves the same technical result through independently written code. Consequently, reverse engineering, clean-room implementation, and alternative coding approaches remain legally permissible, enabling competitors to replicate the functional essence of an invention without infringing copyright.

Software development frequently relies on modular design, incremental improvement, and the recombination of functional ideas, meaning that innovation is often embodied in technical logic and methods rather than solely in literal code. Copyright protection alone is therefore insufficient to safeguard the broader inventive contribution that software represents. This gap has significant implications for incentivising investment in research-intensive software sectors, where developers may lack adequate legal mechanisms to protect novel functionalities, algorithms, or technical solutions embedded in their programmes. It also poses strategic challenges for enterprises

[3]Sec.2 (o) "literary work" includes computer programmes, tables and compilations including computer databases;

[4]Sec.2 (ffc) "computer programme" means a set of instructions expressed in words, codes, schemes or in any other form, including a machine readable medium, capable of causing a computer to perform a particular task or achieve a particular result;

[5]https://www.indiacode.nic.in/bitstream/123456789/1367/5/a1957-14.pdf (accessed on 11 Jan 2026)

seeking to commercialise software innovations in India, as copyright cannot secure exclusivity over the technical advantages that reinforce competitive differentiation.

The case for a sui generis regime for software patents in India is thus grounded in the recognition that copyright, while essential, provides only partial protection for software innovation. For innovators operating in high-investment and technology-intensive sectors such as telecommunications, AI, data analytics, industrial automation, and renewable energy, the functional contribution of software constitutes the core of its value. Without legal protection for these inventive elements, competitors can lawfully replicate functionality through independently written code, thereby diluting incentives for research, experimentation, and commercialisation. The reluctance of the existing patent framework, shaped largely by Section 3(k) of the Patents Act, 1970, to consistently recognise such innovation has resulted in a structural gap between technological advancement and legal recognition.

4. Section 3(k) of the Patents Act

Section 3(k) of the Patents Act, 1970 excludes from patentability "a computer programme per se," thereby placing software at the margins of the patent system. The insertion of the words per se through the Patents (Amendment) Act, 2002, was a deliberate legislative intervention intended to soften the exclusion rather than to impose a blanket prohibition. The Joint Parliamentary Committee[6] made it explicit that the objective was not to deny patent protection to all computer-related inventions, but only to exclude computer programmes as such, while permitting patentability where software formed part of a larger technical invention or contributed a genuine technical effect[7]. Although the amended Section 3(k) sought to balance the prevention of monopolisation of abstract ideas with the encouragement of technological innovation, this objective has largely remained elusive in practice, as patent examination by the authorities continued largely unchanged. Therefore, Section 3(k) has evolved into a doctrinal fault line within Indian patent law.

The absence of a software-specific framework has resulted in inconsistent examination standards, uncertainty for innovators, and prolonged litigation. Judicial decisions have attempted to reconcile innovation with statutory restraint by reading Section 3(k) purposively, focusing on concepts such as "technical effect" and "technical contribution."

[6]Report of the Joint Committee presented to the Rajya Sabha on 19th December, 2001 and laid on the table of Lok Sabha on 19th December 2001

[7]CRI Guidelines 2025- para 3.3 While examining the Patents (Amendments) Bill, 2002the Joint Parliamentary Committee expressed the following views regarding suffix "per se" to computer programme in section 3(k): "In the new proposed clause (k) the words "per se" have been inserted. This change has been proposed because sometimes the computer programme may include certain other things, ancillary thereto or developed thereon. The intention here is not to reject them for grant of patent if they are inventions. However, the computer programmes as such are not intended to be granted patent. This amendment has been proposed to clarify the purpose."

While this approach has enabled the patenting of certain computer-related inventions, it has also transformed Section 3(k) from a clear exclusionary provision into a domain of ongoing judicial negotiation. Each case becomes an exercise in line-drawing, dependent on factual nuance rather than predictable legal rules. Such uncertainty is particularly detrimental in the software sector, where rapid innovation cycles, cumulative development, and high upfront investment demand clarity and predictability in Intellectual Property (IP) protection.

5. Judicial Interpretation as a Bridge between Innovation and Patent Law

In the absence of clear legislative guidance on the patentability of software, Indian courts have increasingly assumed an interpretive role, seeking to reconcile rapid software innovation with the traditional contours of patent doctrine through purposive interpretation. Through a series of decisions, courts have progressively clarified that the exclusion of a "computer programme per se" does not extend to computer-implemented inventions that demonstrate a technical effect or technical contribution.

This judicial approach is prominently reflected in Telefonktiebolaget Lm Ericsson (Publ) vs Lava International Ltd.[8], where in a decision dated 28th March, 2024, the Hon'ble Delhi High Court examined the scope of Section 3(k) in the context of standard-essential patents in telecommunications. Rejecting a literal and mechanical application of the exclusion, the Court held that the mere presence of algorithms or software components does not automatically render an invention non-patentable. Instead, the decisive inquiry is whether the invention results in a practical, real-world technical application. By recognising that software-enabled systems may enhance network efficiency, improve data transmission, or resolve technical problems, the Court shifted the analytical focus from the presence of software to the nature of the technical contribution. This reasoning positioned judicial interpretation as a necessary bridge between outdated statutory language and modern innovation.

A similar corrective role was played by the Intellectual Property Appellate Board (IPAB) in Accenture Global Services GmbH v. Assistant Controller of Patents.[9]. In this case, the IPAB rejected the prevalent administrative assumption that software-related inventions must involve novel or specialised hardware to escape the bar under Section 3(k). The Board observed that neither the Patents Act nor the Patent Office Manual imposed such a requirement, cautioning against importing extra-statutory limitations into patent examination. By emphasising that patentability must turn on the technical contribution of the invention rather than the presence of special hardware, the IPAB acknowledged the reality that innovation in contemporary systems often lies in software architecture, data processing, and system-level efficiencies.

[8]elefonktiebolaget Lm Ericsson (Publ) vs Lava International Ltd [CS(COMM) 65/2016]
[9]Accenture global service GMBH v. the Assistant Controller of Patents & Designs, IPAB, OA/22/2009/PT/DEL, 28th December, 2012
[10]FeridAllani vs. Union Of India &Ors [W.P.(C) 7/2014 & CM APPL. 40736/2019]

The doctrinal shift in the interpretation of Section 3(k) was decisively consolidated in Ferid Allani v. Union of India[10], where the Delhi High Court adopted a purposive and future-oriented approach to the exclusion of computer programmes per se. Acknowledging that modern inventions across sectors such as automobiles, telecommunications, and consumer appliances are intrinsically software-driven, the Court cautioned that a rigid application of Section 3(k) would render contemporary innovation unpatentable, an outcome it characterised as retrograde. Crucially, the Court recognised that emerging technologies such as AI and blockchain are not inherently excluded from patent protection merely because they rely on software or algorithms; rather, their eligibility must be assessed on whether they demonstrate a technical contribution or solve a technical problem, thereby aligning patent doctrine with technological reality. In this context, while adjudicating the issue of non-patentability under the computer programme per se exclusion, the Court, in paragraph 11 of its order dated 12 December 2019, emphasised the global reliance on the "technical effect" and "technical contribution" tests, observing: "Across the world, patent offices have tested patent applications in this field of innovation, on the fulcrum of 'technical effect' and 'technical contribution'. If the invention demonstrates a 'technical effect' or a 'technical contribution', it is patentable even though it may be based on a computer program."

The decision in Enercon India Ltd. v. Aloys Wobben[11] provides a concrete illustration of this approach in an industrial context. In this case, the IPAB examined the patentability of a computer programme controlling wind turbines to optimise power generation. The IPAB held that such a programme could not be categorised as a computer programme per se under Section 3(k) of the Patents Act, 1970, as it executed a technical process and produced a measurable technical effect. By recognising that software-driven control systems functionally integrated with industrial machinery are capable of patent protection, the Board reinforced the principle that patentability analysis must be guided by the substance of the invention, its functional integration, and the technical outcome achieved, rather than by the mere presence of software.

Collectively, these decisions reveal a consistent judicial effort to bridge the widening gap between innovation and patent law by recognising technical contribution and industrial applicability as markers of eligibility. However, judicial interpretation, by its very nature, is irregular, reactive, and case-specific. While these interventions have mitigated the harshness of Section 3(k), reliance on courts to continually recalibrate patent doctrine generates uncertainty, procedural delays, and inconsistent outcomes. Against this backdrop, the case for a sui generis regime for software patents gains force.

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[11]Enercon India Ltd. v. Aloys Wobben, ORA/6/2009/PT/CH & M.P. Nos. 15/2010, 29/2010, 77/2010, 45/2011 & 6 & 7/2013 (Intellectual Property Appellate Board, Delhi Bench, decided on 23 January 2013

[12]https://www.pib.gov.in/PressReleasePage.aspx?PRID=2149719&reg=3&lang=2 (accessed on 11 Jan 2026)

6. Decoding the CRI Guidelines, 2025

The latest development in this matter is that on 29 July 2025[12], the Office of the Controller General of Patents, Designs and Trade Marks (CGPDTM) released the Revised Guidelines for Examination of Computer Related Inventions (CRIs), 2025[13], marking a decisive step in modernising India's patent examination framework in response to rapid advances in Information and Communication Technology (ICT) and AI. These revised guidelines seek to address long-standing ambiguities surrounding the patentability of software-implemented inventions and to align examination practice with the evolving judicial doctrine under Section 3(k) of the Patents Act, 1970. Their significance must be understood against the backdrop of a profound technological transformation across sectors such as healthcare, education, finance, cybersecurity, telecommunications, and industrial automation, where software-driven systems increasingly perform core technical functions.

Traditional patent doctrines, originally crafted for mechanical and hardware-centric inventions, have struggled to accommodate such developments. The CRI Guidelines, 2025, have attempted to respond to this challenge in a small way by improving interpretational clarity, harmonising examination standards with binding judicial precedent, and reducing uncertainty in the treatment of computer-related inventions.

The central focus of the revised guidelines remains Section 3(k), particularly the exclusion of a "computer programme per se." The expression per se is clarified to mean "of, in, or by itself; standing alone, without reference to additional facts," in line with judicial precedent, thereby reinforcing the principle that patentability must be assessed by examining the claimed subject matter as a whole rather than by mechanically isolating software elements. This purposive approach draws heavily from the landmark decision of the Delhi High Court in Ferid Allani v. Union of India.[14], which held that inventions demonstrating a "technical effect" or "technical contribution" are not rendered non-patentable merely because they are based on computer programmes, a principle now firmly embedded in examination practice.

In Microsoft Technology Licensing LLC v. Assistant Controller of Patents and Designs[15], the Delhi High Court refined the test for assessing patentability under the computer programme per se exclusion in Section 3(k). While examining whether the claimed invention fell within the scope of the exclusion, the Court focused on the technical effect produced by the claimed technical solution, particularly whether the invention went beyond mere user-interface design and addressed issues at the level of computer and network technology. In

[13]https://ipindia.gov.in/writereaddata/images/pdf/CRI/1.%20GUIDELINES%20FOR%20EXAMINATION%20OF%20COMPUTER%20RELATED%20INVENTIONS%20(CRIs)-%202025.pdf (accessed on 11 Jan 2026)

[14]FeridAllani vs. Union Of India &Ors [W.P.(C) 7/2014 & CM APPL. 40736/2019]

[15]Microsoft Technology Licensing, Llc vs The Assistant Controller Of Patents And Designs [C.A. (COMM. IPD PAT) 29/2022]

paragraph 41 of its decision dated 15 May 2023, the Court held that where a technical solution "goes beyond the user-interface level and provides a technical effect and contribution, that is patentable," and where features such as the use of cookies and two-factor authentication are "fundamental to the functioning of computer networks" and involve "complex network-level communication protocols," the invention is closer to the heart of computer and network technology rather than the user interface, and therefore not excluded under Section 3(k).

In Raytheon Company v. Controller General of Patents and Designs[16], the Delhi Court in its order dated 15th September, 2023, categorically rejected the requirement of novel hardware as a condition for software patentability, finding no statutory basis for such a test.

In Blackberry Limited vs Assistant Controller of Patents and Designs[17], the Delhi High Court in its decision dated 30th August, 2024, clarified that while algorithms per se are excluded, inventive contribution may lie in their technical implementation, and in Ab Initio Technology LLC v. Assistant Controller of Patents and Designs[18], improved computational efficiency was expressly recognised as a valid technical effect. At para 38, Hon'ble Court stated: "38. …'Technical effect' is the bridge or the connection between an input and the processor. If an ingenious input system/method is able to allow the processor to give a more efficient and faster output and computation, the effect, in this Court's opinion, would be 'technical'. A 'technical effect' cannot be just about nuts and bolts, or hardware tweaks and transformations. If an innovative input [in the form of a program] allows the hardware to process the output faster, then it would amount to a 'technical effect'. In other words, a well-designed innovative input in the form of a process, system, or method which enhances the computational ability of the processor would undoubtedly result in a 'technical effect' and which goes beyond the usual 'user interface'…"

The Madras High Court in Microsoft Technology Licensing LLC v. Assistant Controller of Patents and Designs[19], by order dated 3rd July 2024, at Para 36[20], observed that a computer-related invention can overcome the exclusion under Section 3(k) if it delivers a system-level technical solution or produces a tangible technical effect by improving the system's functioning and efficacy or by providing a technical solution to a technical problem beyond a specific application or data set.

Beyond eligibility, the revised guidelines clarify that conventional patentability

[16]Raytheon Company vs Controller General Of Patents And Designs [C.A. (COMM.IPD-PAT) 121/2022]
[17]Blackberry Limited vs Assistant Controller Of Patents And Designs [C.A. (COMM.IPD-PAT) 229/2022]
[18]Ab Initio Technology Llc vs Assistant Controller Of Patents and Designs [C.A. (COMM.IPD-PAT) 26/2021]
[19]Microsoft Technology Licensing LLC vs Assistant Controller of Patents and Designs [[(T) CMA (PT) No.49 of 2023, [OA/36/2020/PT/CHN]]
[20]"Para 36.…Thus, even when the claimed invention relates to a CRI, if it results in a technical effect that improves the system's functioning and efficacy (effect on hardware), or provides a technical solution to a technical problem and is, therefore, not limited in its impact to a particular application or data set, it would surmount the exclusion under section 3(k) of the Patents Act…"

requirements such as novelty and inventive step apply to CRIs in the same manner as to other inventions, with explicit reliance on the "Seven Stambhas Approach" articulated in Telefonaktiebolaget LM Ericsson (Publ) v. Lava International Ltd.,[21] thereby enhancing analytical rigour, transparency, and accountability. They also emphasise sufficiency of disclosure, particularly for AI-related inventions, adopting the reasoning in Caleb Suresh Motupalli v. Controller of Patents[22], and require enablement sufficient to reproduce the invention, including clarity on algorithmic and functional aspects.

By consolidating judicial interpretations, identifying indicators of technical effect, and moving decisively away from the discredited "novel hardware" test of earlier guidelines, the Revised CRI Guidelines, 2025, represent a procedural correction.[23] rather than a source of substantive law. Therefore, only a sui generis regime for software patents could clearly distinguish between unpatentable abstract ideas, algorithms, and business methods, and the patent-eligible software inventions that deliver demonstrable technical solutions. By explicitly recognising technical contribution as the core criterion for protection, the law would reduce reliance on judicial improvisation and provide consistent guidance to patent examiners and applicants. Safeguards such as limited patent terms, mandatory disclosure obligations, and protections for interoperability and research would further ensure that software patents promote innovation without creating excessive monopolies.

7. Administrative Responses

India's administrative response to software innovation, centred largely on the issuance and periodic revision of the CRI Guidelines, continues to suffer from deep-seated structural limitations that undermine legal certainty and innovation policy coherence. The ambiguity has resulted in inconsistent interpretation across patent examinations and adjudicatory outcomes, discouraging long-term research and development investments, particularly for start-ups and micro, small, and medium enterprises (MSMEs) that lack the resources to navigate prolonged and uncertain patent prosecution. While copyright law offers an alternative form of protection by classifying computer programmes as literary works remains basically inadequate for software innovation. While the judicial interventions have been largely progressive, their case-specific and interpretive nature has generated unpredictability, leaving patentability determinations dependent on litigation outcomes rather than ex ante legal certainty. This over-reliance on judicial interpretation

[21]Telefonktiebolaget Lm Ericsson (Publ) vs Lava International Ltd [CS(COMM) 65/2016]
[22]Caleb Suresh Motupalli vs Controller Of Patents [C.M.A. (PT) No. 2 of 2024]
[23]The CRI Guidelines, 2025 - Para 1.4. 'It is important to mention that these guidelines do not constitute rule making. In case of any conflict between these guidelines and the statutory provisions of the Patents Act, 1970 (as amended), herein after referred as "the Act", or the Patents Rules, 2003 (as amended), herein after referred as "the Rules", made there under, the said provisions of the Act and Rules will prevail over these guidelines.'

is compounded by administrative discretion vested in patent examiners, whose decisions often vary based on individual understanding of software technology and evolving case law.

The absence of a coherent and predictable framework for protecting software-based inventions undermines flagship national initiatives such as 'Digital India', 'Startup India', 'Make in India', and the 'National AI Mission', all of which rely fundamentally on software and data-driven technologies. Without a stable legal architecture that recognises and incentivises software innovation, administrative guidelines alone remain an incomplete and fragile response, incapable of aligning India's patent system with its ambitions as a global technology and innovation hub.

8. Accelerated Developments in ICT and Artificial Intelligence

Recent developments in ICT and Computer Science, particularly AI, blockchain technology, quantum computing, cloud computing, and the Internet of Things (IoT), are rapidly transforming industries and redefining innovation. Vital to this evolution are Machine Learning, Natural Language Processing (NLP), and Large Language Models (LLMs), now recognised as core technologies enabling sophisticated automation, customised user experiences, and predictive analytics. Their integration across healthcare, finance, and education is enhancing overall system intelligence. Quantum computing represents a paradigm shift, with quantum algorithms capable of solving problems in seconds that would take classical systems centuries. This has transformative implications for cryptography, climate modelling, and pharmaceutical development, prompting significant investment by technology companies and research institutions to accelerate commercialisation.

The adoption of 5G and emerging 6G technology is further reshaping the ICT landscape by enabling high-speed, low-latency connectivity for IoT, Augmented Reality (AR), and Virtual Reality (VR). Collectively, the convergence of AI, cloud computing, cybersecurity, quantum computing, blockchain, and 5G/6G is nurturing a robust digital ecosystem and driving a surge in patentable innovations.

9. Global Approaches to Software Patentability

A comparative survey of major patent jurisdictions reveals that India occupies a distinct and increasingly strained position in the global landscape of software patentability. The United States has historically adopted a broad and pragmatic approach to patentable subject matter, premised on incentivising technological innovation while guarding against the monopolisation of abstract ideas. This approach was firmly articulated in Diamond v. Diehr[24], where the U.S. Supreme Court held that a computer-implemented invention does not become unpatentable merely because it employs

[24]Diamond v. Diehr (1981) 450 US 175: 209 USPQ 97

algorithms or mathematical formulas, so long as it is applied to produce a concrete and useful industrial result. By focusing on the invention as a whole and its practical application, rather than isolating the software component, the Court established an early doctrinal foundation for accommodating software-driven inventions within patent law.

Although subsequent decisions, most notably Alice Corp. v. CLS Bank International,[25] imposed important limits by excluding claims directed solely to abstract ideas implemented on a generic computer, the U.S. framework continues to provide relatively clear analytical tools. Under the Alice two-step test, namely 'claims that improve the functioning of a computer itself' or 'address a specific technological problem' remain patent-eligible, thereby preserving space for genuine software innovation while curbing overbroad or purely conceptual monopolies. Compared to India's Section 3(k), the U.S. approach offers greater doctrinal clarity and ex ante predictability for innovators and investors alike.

The European Patent Convention (EPC) adopts a more calibrated exclusion by disallowing computer programmes "as such," while simultaneously permitting patents for software-based inventions that produce a "further technical effect" beyond the normal physical interactions between software and hardware. Through the jurisprudence of the European Patent Office, this concept of technical effect has been systematically developed to include improvements in computer performance, data transmission efficiency, or control of industrial processes.

Japan adopts an even more explicit and innovation-friendly stance by recognising software as patentable subject matter when it embodies a "technical idea utilising the laws of nature," thereby embedding software protection firmly within the statutory framework itself rather than leaving it to interpretive discretion. Together, these jurisdictions demonstrate that software can be coherently accommodated within patent law through tailored statutory language and well-defined doctrinal tests that balance innovation incentives with public interest concerns.

India, by contrast, continues to rely predominantly on judicial interpretation and administrative guidelines to soften the rigidity of Section 3(k), resulting in uncertainty and fragmentation.

10. The Case for a SUI Generis Regime for Software Patents

The growing conflict between rapid software innovation and the rigid contours of conventional Indian patent law underlines the need for a sui generis regime for software patents. Software is not merely another category of invention; it is inherently distinct in its short development cycles, incremental and cumulative nature of innovation, dependence on interoperability, and its role as an enabling infrastructure across industries. When traditional patent standards, primarily designed for mechanical or chemical inventions, are applied without adaptation,

[25]Alice Corp. v. CLS Bank Int'l, 573 U.S. 208 (2014)

they tend to oscillate between two extremes: unjustifiably excluding genuine technical innovations from protection on the one hand, and granting overbroad monopolies that constrain follow-on innovation on the other.

A software-specific legislative framework would allow the law to recognise these unique characteristics while preserving the core objectives of the patent system. Such a regime could, for instance, provide a shorter term of protection calibrated to the fast obsolescence of software, statutorily anchor the concept of "technical contribution" as the touchstone for protection, and expressly exclude pure business methods and abstract algorithms from its ambit. Enhanced disclosure obligations could curb opaque, black-box monopolies, while built-in safeguards for interoperability, research, and fair use would ensure that protection does not come at the cost of competition or access.

By moving from judicially constructed exceptions to a clear legislative architecture, the sui generis regime would replace uncertainty with coherence. More importantly, it would align software patent protection with India's developmental priorities, nurturing innovation while maintaining a balanced and predictable legal environment.

11. Challenges in Establishing a SUI Generis Regime for Software Patents

The proposal for a sui generis regime for software patents seeks to remedy the structural mismatch in Indian patent law by creating a tailored legal framework that accounts for the distinctive characteristics of software innovation. However, establishing such a regime in India presents a complex set of doctrinal, institutional, economic, and policy-oriented challenges, reflecting enduring concerns relating to monopolisation, access to technology, administrative capacity, and international alignment.

At the doctrinal level, the central challenge lies in articulating clear, predictable, and principled boundaries between patentable and non-patentable software as it would inevitably confront the difficulty of distinguishing genuine technical innovation from abstract logic, algorithms, or business methods merely implemented through code. This problem is further compounded by the inherently cumulative nature of software development, which frequently builds incrementally upon shared standards, interoperable systems, and prior art. To mitigate these risks, a sui generis regime must codify a narrowly construed and statutorily defined standard of "technical contribution," anchoring patentability in demonstrable technical problem-solving, such as improvements in system performance, security, or resource optimisation, etc., rather than in functional outcomes or computational abstraction alone.

Institutional readiness constitutes an equally formidable challenge. The examination of software-related inventions demands high levels of technical expertise, interdisciplinary understanding, and consistency in decision-making. The introduction of a sui generis framework, without corresponding institutional reform, risks exacerbating these deficiencies rather than resolving them.

Finally, any sui generis regime must reconcile innovation incentives with broader public interest and developmental objectives. India's digital policy architecture places

significant emphasis on access, affordability, and open innovation, particularly through initiatives such as digital public infrastructure and open-source platforms. Excessively strong proprietary rights in software could undermine these goals by restricting interoperability and limiting downstream innovation. Accordingly, embedding public interest safeguards, like explicit exclusions for abstract algorithms and pure business methods, robust disclosure requirements, and exemptions for research, experimentation, and interoperability, would be essential. Moreover, the regime must be carefully crafted to remain compliant with India's international obligations under the TRIPS Agreement, while preserving sufficient policy space to respond to domestic economic and technological priorities.

12. Conclusion

It is a universal fact that software innovation no longer operates at the periphery of technological development; it lies at its very core. Contemporary advances in Cyber technologies, fintech, and industrial automation are fundamentally driven by software-based solutions that address complex technical problems and generate tangible industrial outcomes. Despite this reality, Indian patent law continues to engage with software through a statutory framework conceived for a markedly different technological era.

Indian courts have sought to bridge this divide through purposive and future-oriented interpretation. The rulings have undoubtedly advanced doctrinal clarity and prevented the wholesale exclusion of software-driven innovation from patent protection. But this judicial creativity operates within inherent limits. Courts, acting on a case-by-case basis, cannot substitute for a coherent legislative architecture capable of offering predictable, uniform, and prospective guidance. The resulting reliance on interpretive elasticity leaves patentability outcomes contingent on adjudicatory discretion rather than clear statutory standards.

In this context, the case for a sui generis regime for software patents in India becomes more compelling. A tailored framework could explicitly recognise technical contribution as the central criterion for patentability, while clearly excluding abstract ideas, business methods, and algorithmic logic devoid of technical problem-solving. It could also accommodate the distinctive characteristics of software innovation by providing shorter terms of protection, robust disclosure requirements, and safeguards for interoperability, research, and experimentation. These features would ensure that innovation incentives are preserved without permitting excessive monopolisation or hindering cumulative technological progress.

More importantly, the adoption of a sui generis regime is not merely a matter of legal reform but one of strategic and economic necessity. India's ambition to remain a global hub for software development, digital public infrastructure, and technology-driven entrepreneurship depends on a patent system that offers legal certainty, rewards genuine innovation, and aligns with public interest imperatives. By structurally integrating software innovation into patent law through a dedicated legislative framework, India can transform the fragile judicial bridge currently sustaining software patentability into a robust statutory foundation. Such a transition would reconcile innovation with regulation, certainty with flexibility, and private rights with

societal interests, ensuring that India's patent system remains responsive to contemporary technological challenges and capable of supporting sustained digital and economic growth in the decades to come.

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