

**AMBIGUITY IN “PER SE” COMPUTER PROGRAMME TECHNOLOGY  
AND COMPUTER-RELATED INVENTIONS: A LEGAL ENQUIRY ON  
ITS PATENTABILITY UNDER THE PATENT LAW**

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**ABSTRACT**

*In the digital age, the patentability of computer programmes and computer-related inventions (CRIs) under patent law are most debated questions. The phrase “computer programme per se” in Section 3(k) of the Patent Act, 1970, has long been a source of legal ambiguity and debate within the Indian intellectual property and its interpretation plays an important role in determining the patentability of Computer-related inventions in India. The inclusion of the term “per se” by 2002 amendment has created interpretive uncertainty- whether this term totally excludes computer programme or allows patents to the inventions which produces technical effect or technical contribution. The paper argues that even though recent court judgments and IPO guidelines updates reflect a move toward a more practical, substance-based approach, there is still confusion because “technical effect” not clearly defines or applied in the same way across cases. Using a doctrinal research approach, this paper examines the legal text, Indian Patent Office guidelines, scholarly writings and major Delhi High Court judgments to know and understand how the phrase ‘per se’ has been interpreted in Indian Patent Law. It explores how the Indian Patent Office attempts to give practical meaning to this phrase through CRI guidelines and how courts have applied and relied upon the concepts of ‘technical effect’ and ‘technical contributions’ to separate genuinely inventive software-based technologies from non-patentable abstract idea.*

**Keywords:** Computer-Related Inventions (CRIs), Section 3(k) of Patent Act, 1970, Computer Programme per se; Software Patentability, Technical Effect, Technical Contribution, Indian Patent Office guidelines, Doctrinal Research, Judicial Interpretation.

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## I. Introduction

In the 21<sup>st</sup> century, software and computer-related inventions play a vital role in technological innovation and economic growth. With the rapid advancement of AI, information technology and automation, the line between software and hardware-based inventions have become blurred. Nowadays, software applications form an essential part in almost every part of technological field, from communication and healthcare to finance and defense. As a result, the question arises whether computer programmes and software related technologies should be eligible for IP protection (Patent). In India, the main source of confusion lies in Section 3(k) of the Patent Act, 1970, which excludes “a mathematical or business method or a computer programme per se or algorithms” from being Patented (Pornpattra, 2024). The term “per se” was added through 2002 amendment to clarify that not all computer programme is excluded and the intention was to allow patents for software-based inventions if they show technical effect. The inclusion of the term was to align Indian Patent Law with international standards under the TRIPS Agreement, but it has created confusion and uncertainty about what exactly can or cannot be patented when it comes to software-based inventions. However, the law provides no statutory definition of “per se”, leaving much to interpretation by the Patent Office and courts.

The intend behind this exclusion was to prevent the monopolization of abstract ideas, algorithms and mathematical methods while allowing patents for inventions that involve the use of computer programmes but also produce a technical effect or technical contribution. Over the past decades, the IPO has issued a series of Guidelines for the Examination of Computer-Related Inventions (CRIs) (2013,2016,2017, and the latest draft of 2025). These guidelines attempt to clarify what qualifies as a patentable computer-related invention. Similarly, Indian courts- particularly Delhi High Court have played a significant role in interpreting the Section 3(k) by giving landmark judgments in the cases *Ferid Allani v. Union of India* (2019 SCC online Del 1186), *Microsoft Technology Licensing v. Assistant Controller of Patents* (2022 SCC Online Del 3738) and *AB Initio Technology LLC v. Assistant Controller of Patents* (2024 SCC Online Del 5259), the courts have recognized that inventions producing technical effect should not be automatically excluded from patentability merely because they are computer-implemented (Pornpattra, 2025).

The ambiguity over the term “per se” continues to create significant legal and policy challenges. On one hand, if software patents are interpreted too broadly, they could give

exclusive rights over basic algorithms or methods, which might slow down innovation and limit access. On the other, if the exclusions are applied too strictly, they could discourage research and investment in fast growing fields like AI, data analytics, and digital security. Achieving the right balance between innovation and protecting public interest requires a clearer and more consistent legal framework. This paper explores this ongoing ambiguity. It studies how the phrase “per se” has been interpreted in law, how the IPO’s CRI guidelines attempt to apply this interpretation, and how courts have used the “technical effect” test to decide what qualifies as a patentable computer-related invention. The research aims to find whether India’s current approach provides sufficient clarity or whether reform is needed to strike a fair balance between encouraging technological innovation and preventing the monopolization of abstract ideas. Ultimately, the paper aims to understand the scope and limitations of patent protection for computer-related inventions in India and to evaluate whether existing interpretations effectively balance the goals of encouraging technological innovation while safeguarding public access and preventing over patenting of abstract ideas. Even after many significant legal and administrative efforts, the patentability of computer programmes and computer-related inventions in India still filled with uncertainty due to ambiguous meaning of the term “per se” under Section 3(k) of the Patent Act, 1970. The main issues include:

- a) Ambiguity or vagueness in the interpretation of the term “per se” under Section 3(k).
- b) Whether a software-based inventions that produces a technical effect is patentable and also what qualifies as a “technical effect” or “technical contribution”.
- c) What is the need to change the CRI guidelines so frequently?

This uncertainty affects patent prosecution outcomes, investor confidence and innovation policy- particularly for startups and tech companies working in AI, digital technologies and more like this.

## II. Ambiguity in the Term “Computer Programme Per Se”

The ambiguity given to the term computer programme per se under Section 3(k) of the Indian Patent Act has been one of the most intransigent barriers to the consistent evolution of the forthcoming software-based innovation economies. The confusion is not created by the complexity of the laws but by the silence of the law. The phrase was inserted in Parliament with no definition of its substantive nature and any evidentiary conditions, creating a gap in the interpretive methodology. Consequently, virtually all stakeholders such as patent examiners, the courts, innovators, industry leaders, investors and scholars look at Section 3(k) through

various conceptual lenses (Terry, 2023). There have arisen two large schools of interpretation. The former school takes a formalistic perspective and holds that software, regardless of its form, be it source code, object code, embedded functionality or compiled executable is non-patentable due to its creative nature being the result of the embodiment of algorithms. This stance is usually supported with the fact that the copyright law already defends this sort of expressions and as such, there should be no need to allow the protection of such expression under patent. Another concern raised by proponents is that a possible issue with patents on software is that it would contain anticompetitive monopolies on computational logic, which, in this case, would prevent downstream innovation and inhibit digital entrepreneurship. They caution that patenting algorithmically driven systems would create a phenomenon known as patent thickets which will cause exorbitantly high licensing and litigation expense to small-scale developers.

The second of the interpretive schools takes a more technologically based functionalist perspective, which holds that software cannot be categorically excluded since today computing is living and breathing with industrial processes. It is believed under this perspective that software is not the manifestation of a mathematical algorithm but the working backbone of technologies like autonomous robotics, cyber-physical systems, medical diagnostic devices, cryptographic infrastructure, aviation navigation systems, and industrial automation systems and other systems (Zhang, 2024). A technical effect, that is to say, a quantifiable enhancement in the functioning, economy, stability, or industrial suitability of a machine, is a type of technological subject matter when generated by software. Such a view is consistent with the international patent practice, particularly in the European patent office (EPO) where the content of the invention is more important than the form: inventions that are put into practice with the help of software can be patented as long as they address a technical issue in a technical manner. The research posted indicates that the Indian legislature did not want a categorical exclusionary effect of inventions depending on software. Instead, the term *per se* was added to the phrase in order to allow an attempt at limiting monopolization of pure algorithmic structures but still allow software-enabled technological innovation to be patentable. The intent of parliament is further clarified in the light of the 2002 Amendment debates and the requirements of TRIPS compliance where it was sought to make sure that the patent regime in India did not in fact suppress access to the necessary computational logic and did not in any way deter high-technology research (Osha, 2023).

The lack of statutory explanation has however led to a patchwork patent landscape. There is a tendency of the examiners to vary on the weight that should be given to software-related technical contributions and undermine the results in the prosecution. Often innovators are unsure of whether their inventions (particularly those based on machine learning models, optimization algorithms, or embedded systems) are to be understood as abstract logic or technical transformations. Due to this instability in the process, a number of innovators strategically move to either a copyright protection or trade secrecy, even though both are not very enforceable and cannot be used to prevent independent development. It has nearly devastated economic effects, as poor patent protection may lower commercialization success in technology and weaken the motivation to invest in research-intensive digital industries. The ambiguity is not simply a conceptual quandary but rather it is a motor of technological development, legal policy, confidence in investment and national policy in innovation (Soni, 2024a). It highlights the urgent requirement of statutory clarity, examiner standardization, and judicial consolidation in order to ensure that the new digital economy in India can count on a predictable intellectual property system.

### **III. Conceptual and Policy Framework of Trade Secret Protection**

Most of the academic literature also offers a lot of insight into how the uncertainties surrounding computer programme per se have impacted on the development of software patenting in India. Conventionally, Indian jurisprudence classified software as a kind of intangible intellectual production that did not have the physical nature of the traditional industrial inventions. Early literature focused on the conceptual separation between manufacturing-oriented industries and the information-oriented IT sector in which software did not undergo the type of material transformation that is normally anticipated in patent jurisprudence (Keer and Bokhare, 2026). This conventional stance had a heavy hand on the judicial disposition, the administrative examination trends, and the legislative restraint in the 1980s to early 2000s. Nevertheless, modern literary works are largely dismissive of the belief that software is not industrial. The fast technological change has destroyed the line of distinction between intangible computational processes and the industrial processes of the real world. Modern computing, according to scholars, is the nervous system of industrial activity and is an essential part of complex spheres of sensor-integrated manufacturing chains, digital health analytics, and cybersecurity architecture, financial algorithmic systems, logistics automation, autonomous mobility networks, and AI-driven decision systems. Software in these

areas is not just a sequence of code, but an engine that works in the real world. This perception goes directly against the classical framework of classification used by Section 3(k).

One of the themes that has emerged in the literature is the criticism of the inconsistency in examinations level in the Indian Patent Office (IPO) (Soni, 2024b). Observers note that even after various updates of the CRI Guidelines, the examiners have no consistency in determining technical effect, industrial use and hardware-software interface among others. Several scholars maintain that the complexity of technologies has surpassed the ability of bureaucracy, which has led to different results in the same inventions. As an illustration, AI models or data-driven systems are typically subject to unforeseeable objections to algorithmic abstraction even in the case of an objective improvement in system performance. This dissonance is particularly apparent in various patent offices in the regions. Such lack of a legally codified definition of concept of technical effect is another common finding in literature. Even though the 2016 CRI Guidelines tried to give examples, scholars claim that unless there is a statutory authority, such administrative development cannot offer the much-needed stability. It is stressed in the literature that technical effect should be made a test, which can be legally enforced as opposed to a suggestion of interpretation. Moreover, the researchers state that the concept of the technical effect should be perceived as dynamic, as the development of computational innovation is incredibly fast. A technical effect like latency reduction or a better encryption can be considered a technical effect today, but in the next ten years it might change greatly and necessitate a constant optimization of the interpretive standard.

Moreover, researchers indicate that the unstable patent environment is caused by the regular updating of CRI Guidelines. Every revision changes the expectations of the examination minimizing investor confidence and deterring long-term R&D planning. According to academic consensus, the harmonization and stabilization of guidelines have to be done to prevent interpretative volatility. A second significant intellectual input is the recommendation of more isolation to international best practices, particularly the EPO where software relevant inventions are judged on the existing presence of a technical issue, technical answer and technical impact (Germany, n.d.). Generally, literature concludes that the Indian patent system on computer related inventions needs structural legislation to be clarified especially with regard to definitions, conditions and evidence standards to be used on CRI inventions. Lack of such reform can lead to the continuation of inconsistency that will impede innovation and lower the competitiveness of India in world markets of technology.

#### IV. Evolution and Policy Objectives of Section 3(k)

To see how the Section 3(k) actually developed into the policy, it is necessary to take a closer look at the socio-economic and geopolitical factors that affected the policy development. In the late 20<sup>th</sup> century, India was evolving into a large IT-enabled services centre, but they did not have the technologies to compete with the American software giants (Gaon and Wong, 2023). There was a concern among policymakers that allowing the broad software patenting would allow overseas firms to monopolize basic software techniques and prevent domestic innovation in an industry that was at a nascent stage. Section 3(k) was thus a prepared defence; whereby Indian developers have access to vital building blocks of algorithms. The provision had the dual intention of:

- a) *Stop abstract computational logic, mathematical approaches, and algorithmic organisation being monopolised as general bases of digital innovation; and*
- b) *Foster local innovation through the provision of patent protection in the event that software is a component of a bigger technological system that generates concrete industrial deliverables.*

An attempt to achieve this balance was reflected in the addition of the phrase *per se* as an insertion in the 2002 Amendments. As revealed in parliamentary discussions, the intention of legislators was not to absolutely ban software but rather to restrict the scope of protection in such a way that algorithms, mental procedures and abstract reasoning would not be confined to the public domain. The term *per se* is therefore a kind of qualifier: it forbids the patents on software as it is, but it does not forbid the possibility of patenting software provided that it is related to a provable technical effect or even technical contribution (Parekh, 2026). The other policy consideration that is crucial is that India is bound by the TRIPS Agreement that does not allow discrimination of any field of technology. This international system obliges member states to give patents on inventions that satisfy criteria of novelty, inventive step and industrial applicability, irrespective of the technological field. Section 3(k) was thus required to be designed in a manner that would not contravene the international trade requirement but would also guard the domestic technological interests. The balance struck by the provision indicates that India is trying to stay under the TRIPS agreement and ensure it prevents access to the fundamental of calculation.

Nonetheless, the intent of this policy has been perverted into practice. The lack of legal guidelines on how an invention can be considered to no longer be a computer programme per

se and a technical advancement has led to inconsistency and uncertainty. There are those examiners who demand physical hardware novelties, and those who will admit software-based technical advancements. Such a drift is an indicator of a structural inarticulation in law: whereby the focus on avoiding monopolization of algorithms was intended, the application has unintentionally caused excessive exclusion of legitimate technological advances (Priyadarshini and Matilal, 2023). The uploaded research indicates that this ambiguity is detrimental to the very innovation ecosystem that was intended to be fostered by Section 3(k). The absence of reliable patent regimes in a fast-digitalizing economy where AI, robotics, and sophisticated software frameworks are the key drivers of innovations in the industry stifles the investment in the R&D sphere and pushes the innovators towards the jurisdictions, which have more defined CRI regimes.

#### **4.1 Policy Evolution Through IPO Guidelines**

Section 3(k) as interpreted in the Indian Patent Office (IPO) led to the creation of administrative guidance as Computer-Related Invention (CRI) Guidelines, as of 2013, 2015, 2016, 2017, and the draft revisions of 2024-2025. Although these guidelines are not legally binding, they are used as quasi-regulatory tools with a view to integrating the practices of examination in the various regional patent offices. Their development demonstrates the conflict of India to balance the freedom of algorithms and the promotion of innovation in technological industries. Since the language of Section 3(k) as it was originally enacted did not change throughout the decades, policy makers increasingly turned to administrative clarifications to cope with new technological realities (Holman, 2023). Nonetheless, the guidelines not only influenced the patenting climate but also made it volatile as it sometimes incorporated the best practices across the globe but often brought in the element of uncertainty. The analysis below will follow the policy value and constraints of every guideline version.

#### **4.2 Policy Value of the 2013 Guidelines**

In 2013, CRI Guidelines was the first institutional effort to formulate principles that would regulate patentability of software matter in India. Even though the guidelines are short, they represented significant conceptual shift: the guidelines admitted that inventions cannot be rejected only on the basis that software is the means through which the invention is to be performed. This acknowledgment marked the start of some functionalist approach, unlike the previous formalistic interpretations where software was viewed as non-industrial.

In 2013, the Guidelines put more focus on examination based on technical application, which meant that the existence of a computer programme was not a sufficient condition to invoke Section 3(k). It was the first time when examiners were motivated to seek technical development, industrial integration, and hardware interaction. This action brought the Indian administrative function nearer to the European style of the Patent Office of evaluating the technical contribution instead of the formal attributes (Singh and Upadhyay, 2024). In spite of these developments, the guidelines did not contain specific criteria or examples of illustrations. The flexibility of their language was due to the use of open-ended language, which also led to interpretive inconsistency. Examiners took different standards on what was considered as technical effect, and applicants commonly had diverse objections of the same subject matter. However, the 2013 Guidelines provided the policy groundwork of a more technologically informed conceptualization of the software patentability.

#### **4.3 Policy Shift in the 2016 Guidelines**

In India, the 2016 CRI Guidelines were the most important policy step in the administration of computer related inventions. Conscious of the incessant uncertainty, the IPO presented clear signs of technical effect such as:

- a) *increased data processing speed or throughput,*
- b) *increased efficiency in the use of resources,*
- c) *manual decision-making being replaced, iv. enhanced protection against the communication networks,*
- d) *higher machine performance.*

The following were examples used as proxies in assessing the technical value of a software enabled invention. Their expression marked a shift of general principles to operational standards, which facilitated more predictable and evidence-based scrutiny. Candidates were now able to contextualize their claims and specifications to show how their software-generated results led to quantifiable machine level results (Vaid et al., 2023).

The 2016 Guidelines left hardware-based understandings as well. Although the novelty was made up of software logic, the invention could still be patented provided that it resulted in a technical improvement that was demonstrated. The strategy was consistent with the international jurisprudence and judicial observations of a case like *Yahoo v. Electronic Navigation Research Institute v. Controller. controller*, which focused rather on functional

analysis than on simple categorization. The 2016 Guidelines were regarded by many researchers and practitioners as a forward-moving action that justified the changing character of computational technologies. They gave people clarity to the innovators in cryptography, data optimization, AI architecture, and autonomous systems, where technical advances are dominated by software.

#### **4.4 Regressive Effect of the 2017 Guidelines**

The 2017 CRI Guidelines however took a sharp turn with the focus coming back to hardware-centric model. Their requirements included novelty on an applicant level, which had to be of physical hardware components, instead of enhancement caused by software logic enforced on preexisting hardware frameworks. This was a reversal that was against the judicial direction as well as the technological fact that recent innovation is likely to be based on software-level optimization instead of a modification of the physical machine. The new 2017 Guidelines have brought about a renewed uncertainty as it suggested that improvements via software were not patentable without new hardware. This reading was inconsistent with the progress of AI, data engineering, cloud computing and cryptographic security where the technical contribution is not always based on physical machines but on the architecture of algorithms. Critics claimed that the 2017 amendment effectively rescinded the achievement of the 2016 Guidelines and placed impractical requirements on digital industry applicants to do so. Consequently, more innovators were turning to non-patent protection or shifted their patent applications to other countries that had more stable CRI regimes (Sharma, 2025). There was a retrogressive implication to the 2017 Guidelines, though, which was the loss of confidence in the uniformity in the Indian administrative system and structural gaps in intellectual property regulation.

#### **4.5 Draft Version 2024-2025**

The 2024-2025 draft CRI Guidelines are an indication that the assessment models will go back to a more judicially consistent, technologically realistic evaluation model. The draft takes a technological outcome measure, which is based on functional contribution more than linguistic framing. This methodology is based on modern jurisprudence especially *Ferid Allani v. Union of India*, in which the Delhi High Court made it clear that software facilitating a technical effect cannot be omitted merely due to its digital performance. Some of the major aspects of the draft are:

- a) *focus on technical impact revealed by empirical data,*

- b) *abundance of hardware novelty as a compulsory criterion,*
- c) *concentrate on resolving a technical issue through technical solutions,*
- d) *escapism of excessive formalism of disqualification of claims, tackled the changing technological categories, including AI, blockchain, and advanced analytics.*

Even though the draft provides conceptual clarity, it has no statutory power and, as a result, unpredictability is left. The guidelines have different applications by examiners and applicants are not sure whether they can be enforced in the long run. However, this progressive development manifested the growing readiness of the IPO to coordinate the policy of software patenting with the technological facts and judicial logic (Sharma, 2025). Regular changes in policy have however undermined the forecast ability of the patent system, which influences the innovation strategy and investment prospects.

#### V. Judicial Interpretation as Policy Correction Mechanism

Cases have been influential in building the product patentability of software enabled inventions in India. With incomplete or patchy legislative and administrative guidance, the judiciary has turned into the leading stabilizing factor, a de facto policy correcting force, supplementing statutory interpretative clarity that seals the gaps. The case *Ferid Allani v. Union of India* was a landmark case. Union of India defined that wholesale barring of software inventions does not align with the Indian pledge of innovation and technological advancement under the constitution (Odeh, 2022). The Delhi High Court said that a computer-implemented invention that shows achievement of a technical effect or technical contribution should not be dismissed simply because it was a software-based invention. This decision was a direct attack on formalistic interpretations and a boost to a functional approach based on global patent values.

Likewise, the court in *Microsoft Technology Licensing LLC v. Assistant Controller of Patents* stressed that the contribution of the invention had to be evaluated in terms of its capacity to generate a tangible technical enhancement, i.e., improved processing power or system stability whether or not the innovation was all in software logic. The ruling highlighted that most recent technology innovations do not involve the need to purchase new hardware but rather realize significant progress through software-based optimization.

The other major decision, *AB Initio Technology LLP v. Controller of Patents*, restated that the determination of patentability cannot be carried out with the help of linguistic drafting or insertion of random elements of hardware. The judiciary ruled that the form or appearance

should not be the basis of evaluation: the existence of software does not take away the technological nature of the invention. This is in line with global jurisprudence which has denounced the so-called claim dressing where applicants contrived to incorporate generic hardware in a bid to avoid exclusions. This set of decisions has a corrective effect as they:

- a) *Reiteration of the intent of the legislation: Section 3(k) does not preclude all software-facilitated inventions.*
- b) *Reducing administrative variation: removing the incentives to such semantics - testing technical contribution, not semantics.*
- c) *Bringing Indian practice into the worldwide standards, especially the technical effect of the EPO doctrine.*
- d) *The guarantee of the technological evolution and the R&D investment through innovative constitutional values.*

The judicial system therefore serves as a stabilization mechanism correcting the legislative grace and wavering administrative policies (Sherman, 2024). It provides the applicant with a better interpretive structure, where the applicant can explain his or her inventions in terms of use, technical development, and quantifiable impact, and not in terms of novelty of hardware or language creation.

## VI. Implications of Legal Policy on Industry

Section 3(k) is ambiguous with far-reaching consequences on industrial development, commercialization strategies, and innovation ecosystems in the country. The results of the uploaded research provide some insight on some of the most important consequences of policy:

### 6.1 Less Investment Confidence

The importance of legal certainty among investors, especially those who fund high-technology industries like AI, fintech, robotics, cybersecurity, and medical analytics, is the key factor in analyzing patent portfolios. Variation in application of CRI standards instils doubt on whether a software-implemented product can receive or defend a patent in India. Such uncertainty discourages investors to fund high-risk high-research projects. Foreign companies, used to stable governments such as the USPTO or EPO, are often encouraging Indian companies to patent their inventions in other countries and first seek protection there (Ehirim and Koiki-Owoyele, 2025). The effects of such practices include loss of the domestic technological ownership and undermined intellectual property capital in India.

## **6.2 Move towards Secrecy and Copyright**

The innovation power of patent is not so predictable, as a result, innovators frequent their trade secrets or copyright, which are less effective and cannot stop independent development or reverse engineering. Trade secrecy leads to discouragement of disclosure too and this discourages the very purpose of patent system to facilitate technological knowledge-sharing. This move shortens the stock of publicly available information regarding technology that otherwise would be used to accumulate knowledge on the national level (Bayamlıoğlu, 2023).

## **6.3 Increased Exposure to Post-Grant Contest**

Inequalities in the standards of examination put granted patents under post-grant opposition in Section 25. The competitors often use Section 3(k) as a basis to invalidate them on the ground that the invention is a computer programme in itself. This approach is specifically prevalent in industries where small technical differences hold a significant volume of commercial worth, e.g. fintech algorithms, and the use of cybersecurity measures. This practice is highly widespread in the industry where small technical differences are valued at a significant amount of commercial worth, e.g. fintech algorithms, and the application of cybersecurity measures. The increased risk reduces the willingness of the applicants to use the long-term patent litigation strategy and weakens the confidence in the sustainability of granted rights.

## **6.4 Increase in Costs of Litigation**

Due to the disruption of the administrative structure to offer consistent and foreseeable norms, a large number of conflicts are taken to the courts. It is litigation, which is the main route of clarifying patentability, and this ends up making protecting intellectual property costly by a significantly large margin (Bayamlıoğlu, 2023). It mostly affects smaller firms, start-ups and academic spin-offs, which cannot afford protracted litigation due to a lack of financial resources. Further, lack of clear statutory standards encourages adversarial behaviour which places pressure on the courts and slows down the enforcement process.

## **6.5 Greater Stake in the National Innovation Capacity**

In technologically advanced industries, like AI-assisted diagnostics, fintech fraud detection, autonomous navigation, and cyber-physical systems, commercial scalability is directly affected by patent certainty. The absence of foreseeable protection leads Indian inventors to give preference to such jurisdictions as the U.S., Europe, Singapore, or Japan and, as a consequence,

externalize intellectual capital and restrain the knowledge retention at home. In the absence of predictable protection, Indian inventors tend to prefer such jurisdictions as U.S., Europe, Singapore, or Japan and, thus, externalize intellectual capital and prevent knowledge retention at home (Singh and Vinjamuri, n.d.). This leakage of patent applications makes India less competitive in the world and eliminates chances of Indian employment, production, and technological growth.

## VII. Analytical Findings from Policy Review

The systematic analysis of the statutory language, administrative policy, judicial rulings, industry reaction, and the academic deliberation indicate that a number of background trends exist that inform India to deal with computer-related inventions (CRIs). These analytical results shed light on why ambiguity remains in Section 3(k) despite 20 years of interpretation. The subsequent discussion summarizes the key themes that will be brought out by the review of the policy.

### 7.1 The Uncertainty in Statutory Law.

The lack of a statutory definition of the term computer programme per se is the only most important source of policy ambiguity. In contrast to such terms as those of inventive step or of industrial application, which have undergone the process of gaining a doctrinal precision by legal interpretation, per se is not legally defined. This produces a vacuum in interpretation that has to be filled either by administrative directives, or by judicial logic, giving rise to nonuniformity. That silence in the legislature implies that it is not clear where the borderline between abstract computation and technical invention is placed. Examiners thus use subjective standards in identifying an effect as technical and the results of examinations are therefore inconsistent and conflicting. Such inconsistency is enhanced by the complexity of technology, particularly in areas where the boundary between algorithmic reasoning and physical action is unclear, including artificial intelligence, neural networks, and cryptographical engineering.

### 7.2 Courts Have Sealed Loopholes in the Legislature.

The decision of the court has played a significant role in stabilizing the practice of interpretation. According to Ferid Allani, Microsoft Technology licensing and AB Initio Technology, the courts have continually opposed the use of strained interpretations that would characterize the inventions that are powered by software as categorically unscathed. The criteria based on language or formalism are less important than functionality and technical

contribution, the latter being the focus of courts. Through this, the judiciary is in effect carrying out a policy corrective role, in that the patent system is in accord with technological realities and constitutional requirements to encourage scientific research. Judicial interpretation can however not replace a clarity of a legislature. You can use courts to rectify, improve or discipline administrative practices, but ambiguity in the statute still places structural strain on the system.

### **7.3 Administrative Guidelines Are still in the Transition**

Even though IPO policies attempt to coordinate practice, they are not statutory. Their amendments with 2013, 2015, 2016, 2017, and 2024-2025 draft also include administrative efforts to interpret the changing technologies instead of being legislative guided. As a result; guidelines are often altered, examiners have different ways of interpreting them, and they cannot be counted upon by applicants on a permanent basis to do the planning. Their value as policy instruments is weakened because of their lack of permanence. The guidelines are taken as guidelines, and it is expected that the applicants will consider them as tentative and that they may be revised at some time to nullify previous assumptions. Such instability is contrasted to such jurisdictions as the EPO where guidelines are comparatively stable and judicially intertwined.

### **7.4 Innovation Stakeholders There are no Uniform Expectations**

The various stakeholders, including innovators, examiners, attorneys, judicial bodies, and investors, work using varying interpretations of what is barred or permitted under Section 3(k). For example:

- a) *Other examiners require that an invention must not be patentable unless its hardware is new;*
- b) *Others embrace technical improvements that are software based;*
- c) *Courts use functional interpretations; some are strict in interpretation of per se; iv. Innovators are not certain on whether to write according to the IPO or the opinion of the judiciary.*

This division makes intellectual property ecosystem fragmented such that the outcomes rely on interpretive chance rather than legal predictability.

### 7.5 Business Tangibles.

There are the direct economic implications of the ambiguity. Devoid of quality patent security:

- a) *to commercialization, it becomes more questionable,*
- b) *start-ups have difficulties in finding investment,*
- c) *there are foreign filings at the cost of domestic filings,*
- d) *enforcement is costly and uncertain.*

These issues decrease competitiveness in the new technological fields of India. High-value sectors (AI-based medical diagnostics, cybersecurity, autonomous navigation, and data analytics) are overrepresented on the list of patent ambiguity, due to the software being the most significant layer of innovation in them.

### 7.6 Analysis of Findings Synthesis

The cumulative results indicate that ambiguity is not present because of the absence of interpretive efforts but because the legislature has not put into writing those judicially tested principles that have been found to be valid. The definition of technical effect has been clarified by courts, and the administrative bodies have tried to perfect the examination practices. However, these interpretations cannot be certain in the long term unless they are supported by statutory anchoring. The alignment between all three is necessary in a coherent policy framework. The lack of clarity is shown by the failure of:

- a) *technological evolution,*
- b) *administrative practice, and*
- c) *legislative inertia.*

## VIII. Conclusions and suggestions

The review of the policies has revealed that Section 3(k) was not meant to ban the software patents but to stop monopolization of the abstract computational structures. The legislative purpose, backed by parliament discussions and TRIPS commitments, was to maintain the access to root logic and allow the protection of patent against a software-enabled technological innovation. Nonetheless, the difference in the intent of law and its application by the administration has led to a patchy patent landscape. The inconsistencies have been redressed through judicial intervention, especially through focusing on functional analysis and technical

effect. But judicial guidance is inadmissible of statutory clarity. The patent system should: to make India competitive in advanced digital technologies.

- a) *codifies judicial doctrine,*
- b) *regularize administrative regulations,*
- c) *increase capacity of technical examination, and*
- d) *present predictable, innovating standards.*

In the absence of a radical transformation, India is at a risk of losing technological advantage in the rising technologies in artificial intelligence, cyber-security, fintech regulation, and autonomous systems. On the other hand, a logical administrative and statutory framework will turn Section 3(k) into a driver of national technological development, rather than a handicap. The general conclusion is evident: the patent system will have to develop in line with the innovations in computer computation. A harmonized framework, which safeguards the incentives to innovation and the right to access, can only be realized through legislative change, institutional harmonization and the technical informed scrutiny, which will be applicable to India. The research posted together with the jurisprudence and scholarly analysis implies that proper reform must be a mixture of legislative changes and administrative reforms. The following recommendations will help transform the patent system in India to be in tandem with both modern technological facts, international best practices, and national priorities in terms of innovation.

### **8.1 Statutory Explanation of the term “Per se”**

The most pressing change is the proposal to introduce a statutory clarification that: computer programme per se the most acute change is that the introduction of the statutory definition of computer programme per se being only to the extent that it relates to computational logic that is non-technical and has no industrial application. This would fix judicial rationale and establish a firm interpretive base. This would fix judicial logic and provide a sound interpretive base. A (statutory) explanation could provide that software is not covered only in cases where:

- a) *the newness of it is only in algebraic form,*
- b) *it has no technical effect which can be measured,*
- c) *it has no industrial use, save as a symbolic computer.*

Codification of this nature would bring Indian law into EPO practice and would ease the burden on examiners.

## 8.2 Technical Effect Codification.

To achieve homogenous examination, the Act ought to provide illustrative, but not exhaustive list of indicators of technical effects. These may include:

- a) *change of operational level, hardware,*
- b) *demonstrable improvement in latency or throughput,*
- c) *the automation of manual functions,*
- d) *improvement of the reliability of communication,*
- e) *improvements connected with security,*
- f) *Artificial intelligence-based system performance optimization.*

The codification would eliminate severe interpretation and offer the examiners a stable assessment system.

## 8.3 Harmonisation of Examination Procedure

To help eradicate the regional inequalities, India ought to adopt nationally standardized examination checklist which is obligatory to all the examiners who screen the applications of CRI. This checklist is to include statutory definitions, judicial standards, and technical-effect criteria. This harmonization will guarantee the use of law uniformly, cut down the rate of opposition and confidence of the applicants. Moreover, consistency is critical to minimize delays in procedures and legal actions as a result of different standards of examination practice.

## 8.4 Technically Trained CRI-focused Examiner Panel

CRI's patent examination not only needs expertise in the legal field, but also in computer science, data engineering, machine learning, and digital architectures. Development of specialized examiner panel that is technically qualified in the field of computing would go a long way in promoting the quality of examinations. Patent offices around the world like the USPTO and EPO extensively employ this model where specific departments deal with software and inventions involving AI. The technical knowledge makes sure that it is the content in complicated inventions that are tested, not the surface level language.

## 8.5 Adoption of Fixed-term guideline validity

One of them is the instability of IPO guidelines. Each new guideline of CRI must stand the test of time at least, unless the legislation is changed. Reforms should be made with transitional

provisions to avoid retroactive uncertainty. Such a solution would decrease administrative discretion and would provide innovators with the chance of knowing their timelines to create and submit strategies.



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