"SCOPE OF PATENTABILITY OF SOFTWARE IN INDIA: A COMPARATIVE STUDY"

Dissertation submitted to the National University of Advanced Legal Studies, Kochi in partial fulfilment of the requirements for the award of LL.M. Degree in International Trade Law

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CERTIFICATE

This is to certify that **Ms. GOPIKA MAHESH, (Reg. No. LM0224008)** has submitted her dissertation titled, **"SCOPE OF PATENTABILITY OF SOFTWARE IN INDIA: A COMPARATIVE STUDY"** to the National University of Advanced Legal Studies, Kochi under my guidance and supervision as a part of her course in "Master of Laws in International Trade Law". It is also affirmed that, the dissertation submitted by her is original, bona-fide and genuine.

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DECLARATION

I, Gopika Mahesh, do hereby declare that this LL.M. Dissertation titled **"SCOPE OF PATENTABILITY OF SOFTWARE IN INDIA: A COMPARATIVE STUDY"**, researched and submitted by me to the National University of Advanced Legal Studies, Kochi in partial fulfillment of the requirement for the award of Degree "Master of Laws in International Trade Law", under the guidance and supervision of Dr. Sandeep. M.N, is an original, bona fide and legitimate work, and it has been pursued for an academic interest. This work or any type thereof has not been submitted by me or anyone else for the award of another degree of either this University or any other University.

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LIST OF ABBREVIATIONS

- BCD - Binary-Coded Decimal
- BSA - Business Software Alliance
- CDPA - Copyright, Designs and Patents Act
- CRI - Computer-Related Inventions
- DMCA -The Digital Millennium Copyright Act
- DLL - Dynamic Link Libraries
- DVD - Digital Video Disc
- EPC - European Patent Convention
- EPO - European Patent Office
- EU - European Union
- FRAND - Fair, Reasonable, and Non-Discriminatory
- IP - Intellectual property
- IPAB - Intellectual Property Appellate Board
- IT -   Information Technology
- NASSCOM - National Association of Software and Service Companies
- PC - Personal Computer
- PCT - Patent Cooperation Treaty
- SEP - Standard Essential Patents
- TRIPS - Trade Related Aspects of Intellectual Property Rights
- UK - United Kingdom
- UKIPO - United Kingdom intellectual Property Office
- US - United States
- U.S.C - United States Code
- USPO - United States Patent Office
- USPTO - U.S. Patent and Trademark Office
- WTO - World Trade Organisation

TABLE OF CASES

- BlackBerry Ltd. v. Assistant Controller of Patents & Designs, C.A. (COMM.IPD-PAT) 229/2022, 2024:DHC:6572 (Del. HC Aug. 30, 2024).

- Bilski v. Kappos, 561 U.S. 593 (2010).

- Enfish, LLC v. Microsoft Corp., 822 F.3d 1327 (Fed. Cir. 2016).

- BASCOM Glob. Internet Servs., Inc. v. AT&T Mobility LLC, 827 F.3d 1341 (Fed. Cir. 2016).

- Symbian Ltd. v. Comptroller General of Patents, [2008] EWCA Civ 1592

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CHAPTER - 1

INTRODUCTION

1.1 INTRODUCTION

Software forms the backbone of modern technological development. It plays a crucial role in almost every aspect of contemporary life, driving innovation, improving efficiency, and transforming industries across the globe. From personal devices like smartphones and computers to large scale industrial systems and public infrastructure, software enables automation, data processing, communication and connectivity. [1] Protecting software through intellectual property (IP) rights is crucial for fostering innovation, ensuring fair competition, and deterring piracy. IP protection provides legal and financial incentives for developers, prevents unauthorized copying, and supports the growth of the software industry, contributing significantly to economic development and job creation. Additionally, it helps enforce licensing terms, safeguarding user rights, data privacy, and security. In a software-driven world, robust IP frameworks are essential for sustaining innovation and protecting creators and consumers alike. [2]

However, software protection through intellectual property law presents some challenges. The two primary forms of IP protection available for software are copyright and patents. There has been much discussion on which of the two is the ideal method for software protection. Different strategies have been used by various nations. The disparities were not even resolved by TRIPS, which aimed to harmonize the patent systems of World Trade Organization (WTO) countries. There are significant debates and scrutiny regarding the patentability of software. In India, regarding the patentability of software, there exist numerous deficiencies. Section 3(k)[3] of Indian Patent Act,1970 excludes certain categories from patent protection, such as, mathematical methods, business methods, computer programme per se and algorithms.[4] The 2016 Guidelines

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[1] The Importance of Software in Computer Systems, AP PGECET, https://www.appgecet.co.in/the-importance-of-software-in-computer-systems/ (last visited May 15, 2025).

[2] Protecting Intellectual Property Rights in Software: A Comprehensive Guide, Grant & Graham (July 3, 2024), https://www.grant-graham.co.uk/en/grant-and-graham-blog/protecting-intellectual-property-rights-in-software-a-comprehensive-guide.

[3] The Patents Act, No. 39 of 1970, § 3(k), India Code (2024), https://www.indiacode.nic.in/handle/123456789/1795.

[4] Id

for the Examination of Computer-Related Inventions (CRIs)[5] issued by the Indian Patent Office clarify the patentability of software. These guidelines emphasize that the invention must demonstrate a technical effect or technical contribution, and claims should not merely cover the software or algorithm but should relate to a specific hardware implementation i.e. the software is patentable only if it is attached with an invention and a hardware must be a part of the invention along with the software. [6] The guidelines were then replaced by the revised cri guidelines in 2017[7] which removed the hardware attachment with software. In UK, software can be patented, it is not strictly necessary for software to be part of a hardware system to qualify for a patent. However, the invention must satisfy specific standards — it should solve a technical problem through a technical solution and demonstrate a meaningful technical contribution beyond abstract concepts or business practices. This means the software should enhance the functionality of a computer or system, improve efficiency, or interact with physical processes.[8] The UK Intellectual Property Office (UKIPO) [9]assesses software patents based on established guidelines that evaluate whether the claimed invention contributes technically to the state of the art. While there is no formal definition of "technical effect," successful applications typically illustrate how the software achieves a significant technical improvement or solves a specific technical issue.[10] In contrast, the United States evaluates software patentability under Section 101[11] of the Patent Act, which covers "any novel and useful process, machine, manufacture, or composition of matter."[12] The scope of software patents in the U.S. has been shaped significantly by case law and USPTO policy. A key shift occurred with the Supreme Court's decision in

[5] Office of the Controller Gen. of Patents, Designs & Trade Marks, Guidelines for Examination of Computer Related Inventions (CRIs) (Feb. 19, 2016), https://ipindia.gov.in/writereaddata/Portal/IPOGuidelinesManuals/1_83_1_Guidelines-for-Examination-of-CRIs-19-2-2016.pdf.
[6] Id
[7] Office of the Controller Gen. of Patents, Designs & Trade Marks, Revised Guidelines for Examination of Computer Related Inventions (CRIs) (June 30, 2017), https://ipindia.gov.in/writereaddata/Portal/IPOGuidelinesManuals/1_86_1_Revised__Guidelines_for_Examination_of_Computer-related_Inventions_CRI__.pdf.
[8] Id
[9] Intellectual Property Office, Guidelines for Examining Patent Applications Relating to Artificial Intelligence (AI), GOV.UK (Jan. 30, 2025), https://www.gov.uk/government/publications/examining-patent-applications-relating-to-artificial-intelligence-ai-inventions/guidelines-for-examining-patent-applications-relating-to-artificial-intelligence-ai--2
[10] Id
[11] 35 U.S.C. § 101 (2018).
[12] Id

Alice Corp. v. CLS Bank International[13], which introduced a two-part test to determine whether a claim is directed at an abstract idea and, if so, whether it contains additional inventive elements that make it eligible for patent. Although the USPTO still tends to interpret eligibility standards more broadly than other jurisdictions, it has adopted a more cautious stance in reviewing software-based claims. In the case of the European Union, software is termed as computer-implemented inventions, The EPO applies The European Patent Convention, which requires that such inventions demonstrate a technical character beyond merely executing software on a generic computer. Patents are granted only when the software, in combination with hardware, contributes a technical solution to a technical problem. This dissertation aims to provide a study on the ambiguities related to patentability of software in India by doing a comparison with the UK, the US[14] and the EU. The inconsistencies existing in India relating to the patentability of software is very evident. By examining the legal frameworks, this study aims to shed a light on their differences, overlaps, the deficiencies and the effectiveness of the systems in promoting innovation and protecting developers' rights.

1.2 STATEMENT OF PROBLEM

The question of whether software can be patented remains a matter of significant debate across different jurisdictions. While some jurisdictions, like the US, have historically been more permissive in granting software patents, others, like India, impose certain limitations and the legal framework carry ambiguities. The differing approaches can create confusion and barriers for software developers seeking IP protection, especially in a globalized market. The International treaty regarding Intellectual property i.e. TRIPS also leave a space in deciding the IP protection given to software. India being a member in the international treaties related to Intellectual property protection carry some uncertainty in providing legal frameworks for the patentability of software. This study aims to shed light on these issues and propose practical solution by doing a comparative study on the legal frameworks of other jurisdictions.

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[13] Alice Corp. v. CLS Bank International, 573 U.S. 208 (2014)
[14] Software Patents in India: Legal Framework & Future Outlook, The Legal School (n.d.), https://thelegalschool.in/blog/software-patents-in-india (last visited May 15, 2025).

1.3 RESEARCH QUESTIONS

- How do the legal frameworks for software patentability differ between India and other jurisdictions like the US, the UK and the EU?

- What are the grounds for copyright protection given to software in these jurisdictions?

- How do patent laws affect innovation and competition in the software industry?

- What are the primary challenges faced by software developers in India in securing patents?

- What legal changes can be made to harmonize the approach to software patents in India by comparing other legal frameworks?

1.4 RATIONALE AND SIGNIFICANCE OF THE STUDY

With the rapid growth in the software industry, intellectual property protection is essential in safeguarding innovation, and there exists ambiguity in the legal framework related to the patentability of software in India. The existing ambiguities can impact innovations, and this research will focus on the challenges arising from these complexities. The countries with clearer rules for software patents can be taken as guidance, since a clear framework for software patents will encourage innovation in India's software sector. Aligning with international practices will attract more foreign investment and collaborations.

1.5 SCOPE AND DELIMITATION

- This study analyses the patent laws governing software in India, with comparative insights into the UK, US, and EU frameworks.

- Focus on legislation, case laws and administrative guidelines in these jurisdictions.

- While focusing on India, the UK, and the US, the study will not delve into the laws of other countries or regional agreements outside TRIPS.

- The study will approach software patents from a legal and policy perspective rather than delving deeply into technical aspects of software development or programming.

1.6 CITATION STYLE

Bluebook Citation Style (21st Edition) for all references, ensuring consistency and academic rigor.

1.7 LITERATURE REVIEW

The article "Software Patents in the Indian Framework: An Economic Analysis of Problems and Prospects"[15] by Meera Jayakumar and A. Harsha Vardhan, published in the National Law School of India Review, critically examines the complex landscape of software patenting within India. The authors argue that the current intellectual property regime inadequately addresses the unique characteristics of software, which complicates its classification under traditional forms of protection such as patents or copyrights. They highlight that the lack of a universally accepted definition for "software patents" contributes to ongoing legal ambiguities, particularly considering the 2005 amendment to the Indian Patent Act, which does not explicitly prohibit software patents. The paper presents a thorough analysis of both the legal and economic implications of software patenting addressing the deficiency in the Indian law regarding the same. [16]

The article "Software Patent in India: A Comparative Judicial and Empirical Overview" by Ravindra Chingale and Srikrishna Deva Rao[17] provides an in-depth analysis of the complex and often inconsistent landscape of software patentability in India, especially considering global trends and legal frameworks. The authors highlight the rapid growth and significance of the Indian software industry, emphasizing the need for a patent system that can effectively accommodate technological innovations without stifling further development. The authors examine how international treaties like TRIPS require countries to extend patent protection to all areas of technology yet allow discretion in defining what qualifies as an "invention," resulting in a variety of national approaches. While jurisdictions like the U.S. tend to allow broader protection, India and the EU adopt a more limited stance—particularly under Section 3(k) of the Indian Patents Act,

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[15] Meera Jayakumar and A. Harsha Vardhan, Software Patents in the Indian Framework: An Economic Analysis of Problems and Prospects, National Law School of India Review, Vol. 20, No. 2 (2008), pp. 220-228

[16] Id

[17] Ravindra Chingale & Srikrishna Deva Rao, Software Patent in India: A Comparative Judicial and Empirical Overview, 20 J. Intell. Prop. Rts. 210 (2015)

which excludes "computer programs per se" from being patented. The article also compares the strengths and shortcomings of using copyright versus patents to protect software, pointing out that copyright fails to cover the functional dimensions of software. The article also examines the evolution of Indian law, key judicial decisions, and the shifting guidelines of the Indian Patent Office, which have contributed to confusion among innovators and legal practitioners. The authors weigh the merits and demerits of software patents, recognizing their potential to incentivize innovation and provide commercial benefits, but also cautioning against risks such as patent trolls and the stifling of incremental innovation. Ultimately, the[18][19]

Joseph Allen Craig's article, "Deconstructing Wonderland: Making Sense of Software Patents in a Post-Alice World,"[20] offers a critical analysis of the evolving and often perplexing landscape of software patent eligibility in US following the Supreme Court's pivotal ruling in *Alice Corp. v. CLS Bank International* (2014). Craig contextualizes software's unique position at the intersection of copyright, trade secret, and patent law, highlighting how its hybrid nature challenges traditional intellectual property frameworks. The article traces the historical fluctuations in U.S. jurisprudence regarding software patents, from early prohibitions against patenting algorithms and abstract ideas, as seen in Gottschalk v. Benson, to periods of broader eligibility based on the production of "useful, concrete, and tangible results." According to Craig, *Alice* did not outlaw software patents outright but imposed a two-step framework that significantly raised the bar for eligibility. This change led to many existing patents being invalidated and created greater legal uncertainty for developers and companies. Craig further examines how the Federal Circuit has attempted to clarify the eligibility standard post-Alice, often resorting to a "technological arts" test that favours patents for technological solutions to technological problems. The article concludes by synthesizing recent case law and critiquing the lack of clear, predictable rules, arguing that the current approach risks stifling innovation by making patent protection for software both uncertain and inconsistent.[21]

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[19] Id
[20] Joseph Allen Craig, Deconstructing Wonderland: Making Sense of Software Patents in a Post-Alice World, 32 Berkeley Tech. L.J. 359 (2017), https://dx.doi.org/10.15779/Z38D21RJ3G.
[21] Id

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Nancy T. Gallini's article, "The Economics of Patents: Lessons from Recent U.S. Patent Reform," published in the Journal of Economic Perspectives in Spring 2002, examines the significant increase in U.S. patent applications and grants from the 1980s to the late 1990s, driven by reforms aimed at strengthening patent protection. The paper discusses how these reforms, which included extending patent rights to new subjects and enhancing enforcement capabilities, were intended to stimulate innovation.

1.8 OBJECTIVES

- To study the IPR protection given to software in India.
- To analyse the specific reasons for copyright protection rather than patent along with issues of innovators and developers.
- To study the CRI guidelines till 2017 and its inconsistencies.
- To study the reasons for patent protection granted to some software in India.
- To do a comparative study and analyse whether there exist jurisdictions where patents are granted to software.
- To study whether that can be borrowed into the Indian context.

1.9 HYPOTHESIS

India's strict exclusion of "computer programmes per se" patent protection provided in Section 3(k) of the Indian Patents Act, combined with broader ambiguities in India's legal framework, often hinders the protection of legitimate software-based innovations. In contrast, the US provides a more stable framework that supports patenting software innovations. In the case of UK and EU, have strict and clearer guidelines related to software patentability. Addressing the legal deficiencies in India could enhance its global competitiveness and better align its patent regime with international standards.

1.10 RESEARCH METHODOLOGY

This research is purely doctrinal, and the primary sources are Statutes, Case laws, guidelines and the secondary sources includes Articles, Books, Journals, E-resources.

1.11 STRUCTURE OF THE DISSERTATION

1. Introduction: The first chapter of the research includes an overview of the research, including the significance of the research, objectives of the research,

hypothesis of research, method of research, and limitations of research. It sets out the rationale, objectives, hypothesis, and methodology adopted in the study. It also introduces the overall idea relating to subsequent chapters. The researcher has tried to give a basic understanding of software patents through the dissertation. Moreover, to understand the problem in depth, the researcher reviewed literature in this regard from various sources. Some articles that the researcher has reviewed are mentioned in this chapter. While reviewing the literature, several questions were raised in the minds of the researcher to which answers were sought. Research questions are framed and started to find the answers to the questions.

2. Software: Definition and scope: The second chapter covers the idea of what software is and its scope across different jurisdictions. The researcher aims to give a clarity on to what software is in Intellectual property regime.

3. Legal framework for software in Indian Regime: This chapter provides knowledge about the Intellectual property laws available for software and the current stage of intellectual property protection given to software in India by analysing statutes, guidelines and judicial decisions.

4. Comparative Analysis: The Fourth chapter analyse the Intellectual property protection laws, especially patent law, granted in different jurisdictions and do a comparison with that of India.

5. Findings and Recommendations: The final chapter is about findings and suggestions. The findings of the study are placed and the suggestions for software patent laws.

1.12 LIMITATIONS OF THE STUDY

The methodology followed for the research is doctrinal and it includes analysing the legal frameworks including the statutes and guidelines in India, UK, EU and US, the provisions included in TRIPS and the case laws relating to patentability of software in these jurisdictions. The study focuses on the legal side rather than the technical aspects of software developing ad programming.

<div align="center">**CHAPTER 2**</div>

<div align="center">**SOFTWARE: DEFINITION AND SCOPE**</div>

2.1 INTRODUCTION

The landscape of technology is evolving rapidly, software stands as a cornerstone of modern innovation, which is woven into the fabric of daily life. From the smartphones that connect us to the cloud-based applications that enhance productivity, software has transformed how we communicate, work, and solve problems. Yet, there is a complex legal narrative that challenges traditional notions of intellectual property (IP) rights. India's legal approach to software patentability reveals several inconsistencies, especially when compared with jurisdictions such as the United States, the United Kingdom, and the European Union.[22] This will be dealt in the comparative analysis.

Software can be defined as a collection of instructions or code that directs a computer or electronic device to perform specific tasks [23]. However, this seemingly straightforward description masks the multifaceted nature of software as both an artistic expression and a functional entity. It embodies creativity in its design while serving practical purposes that range from mundane calculations to complex machine learning algorithms.[24]

The dichotomy between software as a creative work and as a functional tool raises significant questions regarding its patentability. As society has transitioned into an era dominated by digital innovation, the need for clarity in defining software within the context of Intellectual Property law has become paramount.[25] The categorization of software into a certain intellectual property is challenging since the laws are unclear about software. The TRIPS Agreement provides an international framework for the protection of intellectual property, including software, through both copyright and patent provisions. Under Article 10(1), computer programs are protected as literary works under the Berne Convention. Article 27(1) further stipulates that patents must be

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[22] Rajnish Kumar Singh, Patenting Computer Related Inventions: India in Comparison with US and UK, 10(1) Delhi L. Rev. 20 (2018).

[23] Software, Encyclopædia Britannica, https://www.britannica.com/technology/software (last visited May 18, 2025).

[24] Gregory W. Bond, Software as Art, COMM. ACM, Aug. 2005, at 118, https://cacm.acm.org/research/software-as-art/.

[25] Pamela Samuelson, Why Copyright Law Excludes Systems and Processes, 85 Tex. L. Rev. 1921 (2007).

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available for inventions in all technological fields—provided they meet the criteria of novelty, inventive step, and industrial applicability. Although software is not explicitly mentioned, this broad language allows for varying national interpretations. This flexibility has led to divergent global practices, reflecting the continuing debate over software's dual character as both a creative and functional innovation.[26] The conflict between copyright and patent protection in software centres on the different aspects each system safeguards and the resulting strategic dilemma for developers. Copyright automatically protects the specific expression of software, such as source code and user interfaces, but does not cover the underlying functional ideas, algorithms, or processes. This means that while others cannot copy the code verbatim, they can independently develop software with the same functionality using different code, leaving the innovative aspects exposed. In contrast, patents protect the functional and technical innovations in software, such as unique algorithms or system architectures, for up to 20 years, preventing others from using the same methods even if developed independently. However, obtaining a patent is expensive, time-consuming, and requires public disclosure of the invention. This creates a dilemma: relying solely on copyright may not adequately protect the core innovation, while seeking patents involves significant costs and complexity. Many software creators try to use both protections—copyright for the code and patents for the underlying functionality—to maximize legal coverage.[27] The challenge regarding this can be traced in India, where the legal landscape surrounding software patents remains fraught with ambiguity and evolving interpretations.

In India, Section 3(k) of the Patents Act, 1970 explicitly excludes "computer programs per se" from patent eligibility.[28] The Act does not contain any provisions for the patentability of software. This provision reflects a cautious approach towards protecting software inventions, emphasizing the need for a technical effect or contribution beyond mere code.[29] The first Computer-Related Inventions (CRI) Guidelines were issued in 2013, emphasizing a strict stance by requiring novelty in hardware components, thereby

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[26] Ujjwal Kumar Bose, Patenting of Software (Project Assignment, P.G. Diploma in Patents Law, NALSAR Univ. of Law, Nov. 20, 2007)

[27] Gregory J. Maier, Software Protection—Integrating Patent, Copyright and Trade Secret Law, Oblon (n.d.),https://www.oblon.com/publications/software-protection-integrating-patent-copyright-and-trade-secret-law.

[28] The Patents Act, No. 39 of 1970, Section 3(k) (India).

[29] Id

limiting software patentability. This was followed by the 2015 guidelines, which adopted a more liberal approach, allowing for patenting of software with technical applications, sparking concern over overly broad protection. Due to backlash, these were quickly withdrawn. In 2016, revised guidelines reinstated the need for hardware integration and technical advancement, returning to a restrictive interpretation. The CRI Guidelines of 2017 emphasizes that claims must be judged as a whole and not solely rejected for involving software. It also removed the requirement of "novel hardware," focusing instead on the invention's technical contribution. However, confusion persisted due to inconsistent application by examiners.[30] Judicial interpretations have further shaped the landscape of patentability of software., Landmark cases such as *Ferid Allani vs Union of India*[31] have illuminated pathways for patenting software that demonstrates technological advancement or addresses specific technical problems.[32] However, the ambiguities and inconsistencies stand as a challenge for determining the nature of intellectual property protection given to software in a technology driven society.

Jurisdictions like the United States have embraced a more permissive attitude towards software patents. According to Title 35 U.S.C, section 101, software-related inventions may be eligible for patents if they meet specific requirements—particularly when they enhance computer performance or offer a novel solution to a defined technical problem.[33] The U.S. Supreme Court's decision in *Alice Corp. v. CLS Bank*[34], introduced a two-part framework to assess such eligibility. This test examines first whether the claimed invention involves an abstract idea, and second, whether it includes an additional inventive feature that transforms it into a patent-eligible application.[35]

Similarly, the European Union grapples with defining software within its legal framework while balancing innovation and public interest. Article 52(2)(c) of the EPC excludes "programs for computers" unless they yield a further technical effect beyond

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[30] Anubhav Kapoor & Arindam Ghosh, Latest Guidelines for Examination of Computer-Related Inventions in India, IAM Media (Aug. 11, 2021), https://www.iam-media.com/article/latest-guidelines-examination-of-computer-related-inventions.

[31] Ferid Allani and Union of India and Others [2019 SCC OnLine Del 11867 : (2020) 81 PTC 489]

[32] Id

[33] 35 U.S.C. § 101 (2018).

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

[35] Id

standard computer operations[36]—a standard that has been interpreted through various cases by the European Patent Office (EPO).

The United Kingdom's approach mirrors that of the EU but incorporates its own nuances through rigorous tests designed to assess technical contributions in software inventions. The test for determining the patentability of software is the "Aerotel/Macrossan four-step test", formulated by Court of Appeal in the case *Aerotel Ltd v. Telco Holdings Ltd & Macrossan's Application*.[37] This model reflects post-Brexit recalibrations in IP law while maintaining alignment with broader European standards.

2.2 EVOLUTION OF SOFTWARE PATENTS

Over the years, the field of computer software has changed and evolved swiftly. What began as simple instructions used to run early computers has now become a vital part of almost every aspect of our daily lives.[38] Today, software powers everything from smartphones and banking systems to social media and online shopping, in almost all aspects of daily life. As software has become more advanced and valuable, the legal systems around the world have struggled to keep up with its fast growth.[39] One major area where this challenge is clear is in intellectual property (IP) law.

Intellectual property law is designed to protect inventions, creative works, and ideas that give the creators exclusive rights to their works.[40] However, applying these laws to software has not been easy. Different countries have taken different approaches to deciding the IP protection for software. Some treat it more like a literary work, giving it copyright protection, while others allow it to be patented under certain conditions. This has led to many debates about what kind of protection is best, what counts as a true software invention, and how to balance innovation with public access.[41]

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[36] European Patent Convention art. 52(2)(c), Oct. 5, 1973, 1065 U.N.T.S. 199.
[37] Aerotel Ltd v. Telco Holdings Ltd & Macrossan's Application [2006] EWCA Civ 1371.
[38] Dcosta, S., Bhosale, D., V., Vidyapeeth, B. (2020) COPYRIGHT PROTECTION AND PIRACY IN INDIA WITH SPECIAL REFERENCE TO COMPUTER SOFTWARE
[39] Cybersoft N. Am. Inc., The Social Impact of Software: Changing Lives and Communities, Medium (June 15, 2023), https://medium.com/@cybersoftsolutions2015/the-social-impact-of-software-changing-lives-and-communities-39549037a177.
[40] What Is Intellectual Property?, World Intell. Prop. Org., wipo.int/about-ip/en/ (last visited March 7, 2025).
[41] BHAGYAMMA G, PROTECTING DIGITAL INNOVATION: A COMPARATIVE ANALYSIS OF INTERNATIONAL AND INDIAN INTELLECTUAL PROPERTY LAWS, ILE COMPETITION AND COMPANY LAW JOURNAL, 1 (1) OF 2023, PG. 77-88, APIS – 3920-0028 | ISSN - 2583-8385.

The disagreement over how to protect software has created uncertainty for developers, companies, and governments. In some places, strong protection through patents is encouraged to support innovation and investment. In others, there is concern that software patents might limit creativity, raise costs, or block access to important technology. The inconsistencies exist with the patent protection given to software under different jurisdictions, but certain jurisdictions made laws clear in relation with the evolving landscape of IP protection for software.[42]

Intellectual property law, a means to safeguard innovation and promote creativity, has been forced to adapt to the intangible and often abstract nature of software. Unlike traditional inventions or literary works, software exists at the intersection of technical utility and creative expression. [43] This dual character has complicated its classification under existing legal categories of Intellectual property namely, copyright and patent law. While copyright protects the literal code and expression of software, patent law aims to safeguard the underlying functional or technical innovations. Determining the boundaries between these two realms has been a persistent source of legal uncertainty and policy tension.[44]

Historically, the legal treatment of software began with considerable skepticism. The early development of software in the 1940s and 1950s did not initially foresee the need for legal protection. Software was largely shared freely among researchers and computer scientists. However, as it became a commercial asset, there was growing recognition of the necessity to regulate and protect it through law.[45]

The transition of software from a freely distributed tool to a proprietary product demanded legal intervention. Initially, software was considered a "mathematical algorithm," which traditionally falls outside the scope of patentable subject matter. Yet,

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[42] Yi-Lin Lin & Arti Rai, Patent Protection and Software Innovation: Evidence from Alice, 106 Cornell L. Rev. 1135 (2021).

[43] Pratyush Prakarsh et al., The Role of Intellectual Property in Fostering Innovation and Economic Growth, 6 Int'l J. for Multidisciplinary Res. 28732 (2024), https://www.ijfmr.com/papers/2024/5/28732.pdf.

[44] LicenseSpring, Software IP Protection & Rights: Complete Guide, LicenseSpring Blog (Feb. 11, 2025), https://licensespring.com/blog/Guide/software-intellectual-property-protection.

[45] Robert L Graham, THE LEGAL PROTECTION OF COMPUTER SOFTWARE, Communications of the ACM, May 1984 Volume 27 Number 5,pno:423

due to its growing economic value, various jurisdictions began interpreting IP laws to accommodate software.[46]

During the 1950s to 1970s, patent protection for software in the UK and the EU was limited and highly restrictive, reflecting the nascent state of computer technology and legal frameworks for intellectual property. Before the UK Patents Act of 1977, there was no specific legislative framework addressing software patents. Software was generally not considered patentable because it was viewed as a set of instructions or mathematical algorithms, which were excluded from patent protection under traditional patent law principles. The 1977 Act brought the UK in line with the European Patent Convention, which explicitly excluded "programs for computers" from being regarded as inventions eligible for patents, but only "as such." This meant that software could be patented if it contributed to a technical process or had a technical effect beyond the program itself.[47] The EPC, which was signed in 1973, also incorporated an exclusion for "computer programs as such" under Article 52(2). However, this exclusion was partial. If a software-related invention demonstrated a "technical contribution" or solved a technical problem in an innovative way, it could qualify for patent protection.[48] During the 1970s, there was significant uncertainty and debate about the most appropriate form of protection for software. There was no consensus on whether software should fall under patent law, be safeguarded by copyright, or require a unique, sui generis legal regime tailored to its distinct nature.[49] By the end of the decade, it became generally accepted that computer programs themselves were better protected under copyright law rather than patents unless they were part of a broader technical invention.[50] As of 2025, software patent protection in the UK and EU has evolved significantly since the mid-20th century. While software itself is not automatically

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[46] Id

[47] Rob Zijlstra, Patent Protection for Software in the UK – A Practical Approach, ELKINGTON AND FIFE (Mar. 2, 2016), https://www.elkfife.com/news-and-views/2016/03/02/software-patents-in-the-uk.

[48] Sterckx, S., Cockbain, J. (2009) The Patentability of Computer Programs in Europe: An Improved Interpretation of Articles 52(2) and (3) of the European Patent Convention *The Journal of World Intellectual Property 13*, 366-402

[49] World Intellectual Property Organization (WIPO), Software and Copyright, https://www.wipo.int/copyright/en/activities/software.html (last visited May 26, 2025).

[50] Id

patentable, it can qualify for patent protection if it meets specific criteria, particularly demonstrating a "technical effect" or solving a technical problem.[51]

In India, initially influenced by restrictive interpretations of Section 3(k)[52] of the Indian Patent Act, which excludes "computer programs per se" from getting patent, the Indian legal system has gradually moved toward recognizing software-related inventions that demonstrate a technical effect or technical advancement.[53] At the same time, Indian copyright law, through the 1994 amendment to the Copyright Act, brought software within the fold of literary works, thereby affording it protection against unauthorized reproduction and distribution.[54] In 2015, the IPO issued guidelines to clarify the examination process for Computer-Related Inventions. These Guidelines emphasized that software demonstrating a "technical effect" or solving a "technical problem" could be patentable, despite being computer programs.[55] Later the Guidelines were revised and made restrictive about patenting software. This created more inconsistencies in granting software patents.[56]

The global dimension of software protection further complicates the issue. The TRIPS agreement, which is administered by the World Trade Organization (WTO), has harmonized certain aspects of copyright protection for software by recognizing computer programs as literary works.[57] However, TRIPS allow provision for providing software patents under Article 27(1) stating that "...patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application"[58]. This mandates that inventions in all areas of technology be eligible for patent protection, if they satisfy the conditions of novelty, an inventive step, and industrial applicability, while allowing significant variation in interpretation and implementation by different

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[51] Bhardwaj I, Artificial Intelligence and its Patentability: A Comparative Study Between India, and USA. International Journal for Multidisciplinary Research Volume 5, Issue 3, May-June 2023,pno: 22

[52] The Patents Act, No. 39 of 1970, Section 3(k) (India).

[53] Id

[54] Ahmad, Tabrez and Suraj Sing Charan. "Patentability of Computer Software." (2011). Patentability of Computer Software

[55] Faham Ahmed Khan, Intellectual Property Rights for Software, Artificial Intelligence and Computer Related Inventions: A Comparative Analysis, 29 J. INTELL. PROP. RTS. 57 (2024)pno 59

[56] Id

[57] TRIPS Agreement, Article 10(1), WTO

[58] Agreement on Trade-Related Aspects of Intellectual Property Rights art. 27(1), Apr. 15, 1994, 1869 U.N.T.S. 299, 33 I.L.M. 1197 (1994).

countries. This divergence is evident in the contrasting approaches taken by the United States, the European Union, and [59][60]

2.3 SOFTWARE: ACROSS JURISDICTIONS

2.3.1 UNITED STATES

In the present digital world, software runs almost everything, from our smartphones and laptops to the applications that we use for banking, learning, or even socializing. The intellectual property protection afforded to software in the United States has undergone significant evolution, marked by pivotal court decisions and legislative changes. The laws relating to the software patents are broader and elaborate in the US jurisdiction compared to others but initially the US was reluctant in providing patent to software/ computer related inventions. While enacting the Patents Act of 1952, Congressional reports of the 82nd Congress quoted that the act intended statute subject matter to 'include anything under the sun' and this shows the inclusiveness that were intended in providing intellectual property protection.[61] From the 1700s, the US government granted millions of patents and the growth in the field of IP, particularly patent, which has been exponential.[62] In 1802, the US Patent Office was established and later the name was changed into US patent and trademark office in 1975.[63] The Patent Act of 1952 clarified the patent laws that were existing in the US and removed redundancies. Title 35 of the United States code contains the provisions relating to patents in the US.[64] The United States Patent Office issued the first-ever software patent on April 23, 1965, to Martin A. Goetz, a trailblazer in the commercial software sector. The patent was numbered 3,380,029..[65]

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[60] Abhishek Kumar Singh & Suryakant Kashyap, Software Patentability: A Comparative Analysis, Manupatra (2020), https://www.manupatra.com/roundup/323/Articles/Software%20Patentability.pdf (last visited May 15, 2025).
[61] Congressional reports to the 82d congress,2d session 1952
[62] U.S. Patent & Trademark Office, Milestones in U.S. Patenting, https://www.uspto.gov/patents/milestones (last visited May 26, 2025).
[63] Id
[64] Id
[65] Gene Quinn, The History of Software Patents in the United States, IPWatchdog (Nov. 30, 2014), https://ipwatchdog.com/2014/11/30/the-history-of-software-patents-in-the-united-states/id=52256/.

Section 101 of the US Patent Act,1972 defines the inventions that are patentable. According to this, "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title".[66] Section 102 states the patentability conditions, Section 102 of the U.S. Patent Act deals with the concept of novelty, which is a key requirement for patentability. It states that an invention must be new and not previously disclosed to the public before the patent applicant's effective filing date. An invention cannot be patented if, prior to the filing date, it has already been patented, published in any printed material, publicly used, sold, or made accessible to the public by any other means.[67] Additionally, if the invention was described in another person's patent application filed earlier but published later, it may also bar patentability. Section 102 helps ensure that patents are awarded solely for genuinely new inventions, avoiding duplication of existing knowledge. It prevents the re-patenting of known technologies and protects the public domain.[68] Together, these sections ensure that patents are granted only to genuinely innovative and novel inventions, balancing protection of intellectual property with the need to prevent monopolies on basic concepts or existing knowledge.

In the 1960s, the USPTO generally considered software unpatentable, viewing it as mathematical formulas or mental steps. The Supreme Court reinforced this stance in cases like *Gottschalk v. Benson*[69] and *Parker v. Flook*[70], which excluded algorithms from patent protection. [71]

In *Gottschalk v. Benson* [72], the Supreme Court ruled that a method designed to convert numerical data from binary-coded decimal to pure binary form, intended for use in general-purpose digital computers, does not qualify as a patentable process under 35 U.S.C. § 100(b). The Court reasoned that the method involved only mathematical computations or mental processes. The Court reversed the Court of Customs and Patent

[66] 35 U.S.C. § 101 (2018).
[67] 35 USC s102
[68] Id
[69] Gottschalk v. Benson, 409 U.S. 63 (1972)
[70] Parker v. Flook, 437 U.S. 584 (1978)
[71] Daniel A. Tysver, Software Patent, BitLaw, https://www.bitlaw.com/software-patent/index.html (last visited May 18, 2025).
[72] Gottschalk v. Benson, 409 U.S. 63 (1972)

Appeals decision.[73] Justice Douglas delivered the opinion, with all members joining except Justices Stewart, Blackmun, and Powell, who did not participate. The Court emphasized that although a new and useful structure developed through scientific principles may be eligible for a patent, the underlying idea alone is not. The Court determined that granting a patent for the algorithm would essentially monopolize the mathematical formula, which is not allowed.[74]

In *Parker v. Flook* [75], The Supreme Court decided that Flook's technique for adjusting alarm limits during catalytic conversion was not patentable under § 101 of the Patent Act, as its only innovative aspect was a mathematical formula. The Court reasoned that using such a formula in a specific but routine application does not make the method eligible for a patent.[76] Justice Stevens delivered the opinion for the majority, with Justices Brennan, White, Marshall, Blackmun, and Powell joining. Justice Stewart authored a dissenting opinion, which was joined by Chief Justice Burger and Justice. Rehnquist. The Court reversed the Court of Customs and Patent Appeals decision. The Court clarified that the chemical processes, monitoring process variables, using alarm limits, recomputing alarm limit values, and using computers for automatic process monitoring were all well known. Assuming the formula was within prior art, Flook's application contained no patentable invention.[77] *Diamond v. Diehr*[78] marked a turning point by allowing software to be patented if it was part of a broader invention that produced a tangible result. This ruling by the Federal Circuit acknowledged that software-implemented inventions might qualify for patent protection if they were connected to a particular machine or resulted in a real, practical, and useful outcome.[79] The U.S. Court of Appeals for the Federal Circuit affirmed the patent eligibility of financial service technologies and business practices in the 1998 case of *State Street Bank & Trust Co. v. Signature Financial Group*.[80] The ruling validated Signature's patent on a software system designed to manage and calculate mutual fund investments. This decision marked a significant shift, as it confirmed that inventions producing a

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[73] Gottschalk v. Benson, 409 U.S. 63 (1972), https://supreme.justia.com/cases/federal/us/409/63/.
[74] Id
[75] Parker v. Flook, 437 U.S. 584 (1978)
[76] Id
[77] Parker v. Flook, 437 U.S. 584 (1978), https://supreme.justia.com/cases/federal/us/437/584/.
[78] Diamond v. Diehr, 450 U.S. 175 (1981)
[79] Id
[80] State Street Bank & Trust Co. v. Signature Financial Group , 149, F.3d 1368 (Fed Cir. 1998)

"useful, concrete, and tangible result" could be patented, even if they involved business methods. Following this precedent, several other innovations received patent protection, including Amazon's one-click online purchasing system and Priceline's reverse auction model for booking travel and other services.[81] Later there happened a boom in the granting of patents to software in the US.

In *re Bilski*[82] The Supreme Court narrowly upheld the patentability of business methods but set the stage for stricter scrutiny of abstract ideas in subsequent cases.[83]

Mayo Collaborative Services v. Prometheus Labs[84] the Supreme Court highlighted the relationship between novelty and subject matter eligibility, placing limits on the patentability of discoveries rooted in natural laws or abstract concepts. The Court found that Prometheus Labs' claims were not patent-eligible because they essentially sought to patent natural laws—specifically, the relationship between thiopurine metabolite levels and the therapeutic or toxic effects of thiopurine drugs.[85] It noted that the steps described in the claims were routine, conventional practices already used by those skilled in the field. The Court introduced a two-step framework for determining patent eligibility under 35 U.S.C. § 101 when a claim involves laws of nature, natural phenomena, or abstract ideas. The first step is to determine whether the claim is directed to one of these excluded categories. The second step is to assess whether the claim contains an "inventive concept"—that is, additional features that transform the natural law or abstract idea into patent-eligible subject matter. Merely stating a natural law and adding generic or well-known steps is not sufficient to meet this standard.[86]

Alice Corp Ltd. v. CLS Bank International[87] is a landmark ruling by the United States Supreme Court that significantly shaped the legal framework for determining the patentability of software and computer-implemented inventions. Alice Corporation applied for patents relating to a computerized scheme designed to mitigate "settlement

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[81] Gallini, Nancy T. "The Economics of Patents: Lessons from Recent U.S. Patent Reform." The Journal of Economic Perspectives 16, no. 2 (2002): p no: 133. http://www.jstor.org/stable/2696500.
[82] In re Bilski, 545 F.3d at 962.
[83] Fabio E. Marino & Teri H. P. Nguyen, From Alappat to Alice: The Evolution of Software Patents, 9 Hastings Sci. & Tech. L.J. 1 (2017) p no: 8
[84] Mayo Collaborative Services v. Prometheus Laboratories, Inc., 566 U.S. 66 (2012)
[85] Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. 66 (2012), https://supreme.justia.com/cases/federal/us/566/66/.
[86] James W. Cowan, A Hard Test for Software: Decoding an Improved Alice/Mayo Test for Software-Related Patents in the Federal Circuit, 49 AIPLA Q. J. 659 (Fall 2021), pno: 663
[87] Alice Corp. v. CLS Bank Int'l, 573 U.S. 208 (2014)

risk" in financial transactions.[88] The scheme used a third-party intermediary to oversee and manage the exchange of financial commitments between two parties, employing a computer system to create "shadow" credit and debit records.[89] The central question was whether Alice Corporation's claims met the requirements for patent eligibility under 35 U.S.C. § 101, or whether they were based on an abstract concept that falls outside the scope of patentable subject matter. The Supreme Court ultimately ruled that the claims were centered on the abstract idea of intermediated settlement—a financial concept—and that implementing this idea using a standard computer system did not render it patentable. To assess the eligibility of the claims, the Court employed the two-step framework previously outlined in Mayo Collaborative Services v. Prometheus Laboratories, Inc.. Under the first step, the Court identified the fundamental concept underlying the claim—in this case, the practice of intermediated settlement—as an abstract idea. Under the second step, the Court evaluated whether the claim included an "inventive concept" that was sufficient to transform the abstract idea into a patent-eligible invention. This involved analysing the components of the claim both separately and in combination. The Court found no inventive elements beyond the abstract idea itself and ruled that merely implementing the concept on a generic computer was not enough to satisfy the requirements of patent eligibility. The ruling on *Alice* had a significant impact on patent law, especially in the areas of software, business methods, and other computer-related inventions. It has led to increased scrutiny of patent claims involving abstract ideas and has made it more difficult to obtain patents on inventions that are seen as merely implementing abstract ideas on a computer. In Alice, the Court concluded that employing a computer to manage, update, and balance shadow accounts did not contribute any meaningful innovation beyond the underlying abstract concept. The computer implementation was generic and did not transform the abstract concept to the level of a patentable invention.[90] Hence, as the law currently stands, the patent is granted for software in the US according to the Alice/Mayo test which makes a consistency in granting patent to software.

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[88] Seamus Brugh, Alice Corp. Pty. Ltd. v. CLS Bank Int'l 134 S. Ct. 2347 (2014), 19 INTELL. PROP. L. BULL. 105 (Fall 2014).
[89] Id
[90] Id

Copyright law gives IP protection to software in the US, which grants developers exclusive rights over their original code and certain creative elements from the time the software is made and fixed in a tangible medium. Both the both source code written in human-readable form and object code are considered "literary works" under the U.S. Copyright Act, meaning they are automatically protected without the need for registration. This protection extends to original aspects of the software, such as its structure, sequence, organization, graphical user interfaces, and design choices, as long as these reflect original authorship. Copyright also covers derivative works, giving the copyright holder the exclusive right to create adaptations or modified versions. However, copyright does not protect the underlying ideas, methods, or algorithms behind the software—only the specific expression of those ideas in code or creative elements. This means that while others cannot copy the protected elements of the original software, they are free to independently develop similar functionality or reimplement the same features using their own code, provided there is no direct copying. Copyright owners possess exclusive rights over their software, including the ability to reproduce it, distribute copies, create derivative versions, and publicly display or perform the work. They also have authority over licensing and usage terms. Although registration with the U.S. Copyright Office is not a prerequisite for obtaining protection, it is required to initiate an infringement lawsuit and offers added advantages—such as access to statutory damages and the possibility of recovering attorney's fees. Enforcement of software copyright can involve cease-and-desist letters, litigation, and DMCA takedown notices for online infringement. Copyright does not prevent reverse engineering for interoperability under certain fair use [91]

2.3.2 UNITED KINGDOM

Under UK copyright law, software is protected as a form of literary work, a status formally established with the Copyright (Computer Software) (Amendment) Act 1985 and reinforced by the Copyright, Designs and Patents Act (CDPA) 1988. The CDPA explicitly includes computer programmes within its definition of literary works, although it does not define "computer program" in detail. For software to be protected, it must be original, which under UK law means the author has exercised independent

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[91] U.S. Copyright Office, Circular 61: Copyright Registration of Computer Programs (rev. ed. 2021), https://www.copyright.gov/circs/circ61.pdf.

skill, labour, and judgment in its creation—a relatively low threshold compared to some other jurisdictions. Copyright protection covers not only the source and object code but also preparatory design materials. The law distinguishes between ideas and their expression, protecting only the latter; thus, while the specific code and structure are protected, the underlying ideas or algorithms are not. The rights conferred to the copyright holder include the exclusive ability to copy, distribute, adapt, and authorize use of the software. Infringement occurs when a substantial part of the software is copied or adapted without permission, whether directly or indirectly, including through temporary or incidental copying. Notably, UK law provides only narrow "fair dealing" exceptions, such as for research, private study, criticism, or news reporting, which are much more limited than the US concept of "fair use." Reverse engineering, such as decompilation, is generally considered infringement unless it is strictly for interoperability and meets specific legal conditions. The copyright protection for software lasts for the lifetime of the author plus an additional 70 years.[92]

John Richardson Computers Ltd v Flanders[93] involved a dispute where a former employee of John Richardson Computers Ltd developed a competing program for printing pharmacy labels, allegedly using knowledge gained from the original software. The court had to decide whether the new program unlawfully copied the original. Judge Ferris examined similarities in features and user interface but ultimately found infringement in only a few areas. He ruled that copyright protects only the original expression of ideas—such as unique code or features—not the general ideas or methods behind software. This case is important because it introduced the American "idea/expression dichotomy" into UK law, clarifying that software copyright does not cover general concepts or functions, but only the specific way they are expressed. The decision set a precedent for future UK software copyright cases, helping to define the boundaries of legal protection.[94]

The Patents Act of 1977 is the law governing the patents in the United Kingdom. Section 1(2) of act states what are not inventions.[95] `*Aerotel Ltd v. Telco Holdings Ltd*

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[92] Vanessa Marsland, Copyright Protection and Reverse Engineering of Software - An EC/UK Perspective, 19 U. DAYTON L. REV. 1021 (Spring 1994).

[93] John Richardson Computers, Ltd. v. Flanders, [1993] F.S.R. 497 (Ch.).

[94] Id

[95] The UK Patents Act, 1977 Section 1: Patentable Inventions (1) A patent may be granted only for an invention inrespect of which the following conditions are satisfied, that is to say - a. the invention is

& Ors' [96] (commonly known as "Aerotel/*Macrossan")* established a structured approach in determining whether a patent claim comes within the scope of excluded subject matter under Section 1(2) of the act[97]. The four-step derived test established after the case is a template for patent examiners and courts to determine the patentability of inventions, especially in fields such as software and business methods. The first step is to read the claim correctly to determine its scope and meaning. The second step is to determine the genuine contribution of the invention—what it brings to the art or practice. Third, it should be determined whether this contribution is entirely within excluded categories of subject matter, such as business methods, computer programs, or presentations of information. What this implies is that although an invention can seem to be in an excluded category, it could still be patentable if it transcends the mere abstract idea or administrative technique. The fourth step involves ascertaining whether the contribution is technical in nature. A computer program may still qualify for patent protection if it produces a technical effect or provides a solution to a technical problem. The "as such" qualification is therefore crucial in confining the exclusion, enabling innovations that present genuine technical improvements to be eligible for patent protection notwithstanding association with traditionally excluded categories.[98]

In two English High Court decisions in 2009 known as "*AT&T Knowledge Ventures' Application"* and *"CVON Innovations Ltd"* [99] Application, The High Court outlined a five-step approach to assess whether a computer program falls outside the scope of patent exclusion. They are:

1. "whether the claimed technical effect has a technical effect on a process which is carried on outside the computer.

2. whether the claimed technical effect operates at the level of the architecture of the computer; whether the effect is produced irrespective of the data being processed or the applications being run;

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new; b. it involves an inventive step; c. it is capable of industrial application; d. the grant of a patent for it is not excluded by subsections (2) and (3) below; and references in this Act to a patentable invention shall be construed accordingly.

[96] Aerotel Ltd v Telco Holdings Ltd and others; In re Macrossan's Application [2006] EWCA Civ 1371; [2007] RPC 7

[97] Id

[98] Id

[99] AT&T Knowledge Ventures' Application and CVON Innovations Ltd ,[2009] EWHC 343 (Pat)

3. whether the claimed technical effect results in the computer being made to operate in a new way;

4. whether there is an increase in the speed or reliability of the computer; and

5. whether the perceived problem is overcome by the claimed invention as opposed to merely being circumvented."[100]

The UKIPO generally applies these criteria as definitive measures to evaluate whether a software invention qualifies for a patent.

2.3.3 EUROPEAN UNION

The Europe Patent Office (EPO) uses the term "Computer-implemented inventions" for software.[101] According to the European Patent Office, a "computer-implemented invention" refers to an invention that makes use of a computer, a computer network, or another programmable device, with one or more of its features being executed entirely or partially through a computer program.[102]

In the European Union, software patents are granted for software, but not for software "as such,", which requires a "further technical effect" for software to be patentable.[103] Article 52 of the EPC outlines the criteria for patentable inventions.[104] sets forth the requirements for patentable inventions. As stated in Article 52(1), patents in Europe may be granted for inventions across any technological field, as long as they are novel, demonstrate an inventive step, and can be applied industrially.[105] This means that patents are awarded for software-related inventions that solve a technical problem or provide a technical solution, rather than for the software code itself.[106] For an invention

100Rajnish Kumar Singh, Patenting Computer Related Inventions: India in Comparison with US and UK, Dehradun L. Rev., https://www.dehradunlawreview.com/wp-content/uploads/2020/06/3-Patenting-compute-related-inventions-India-in-comparison-with-US-and-UK.pdf (last visited May 23, 2025).

[101] Patents for Software? Law and Practice at the European Patent Office' (2012) European Patent Office <http://www.epo.org/service-support/publications/issues/patents-for-software.html>
[102] Id
[103] European Patent Office, Hardware and Software, EPO, https://www.epo.org/en/news-events/in-focus/ict/hardware-and-software (last visited May 20, 2025).
[104] European Patent Convention art. 52, Oct. 5, 1973, 1065 U.N.T.S. 199.
105 European Patent Convention, art. 52, https://www.epo.org/en/legal/epc/2020/a52.html (last visited May 20, 2025).

106 European Patent Office, Hardware and Software, https://www.epo.org/en/news-events/in-focus/ict/hardware-and-software (last visited May 26, 2025).

to qualify for patent protection, it must be original, demonstrate an inventive step, and be capable of industrial application. Additionally, it should offer a technical solution to a problem in a way that is both new and not obvious. Abstract concepts like business methods or game storylines are not patentable. Original source code and object code are protected by copyright, but this protects only the original expression of a concept, not the underlying technical concept [107]

The evolution of patentability in Europe can generally be divided into three main phases. The first phase, which occurred prior to the 1960s, was characterized by the existence of separate national patent frameworks within individual European countries.[108] Among these, the United Kingdom, Germany, and France emerged as the foundation for the development of the future European patent system. [109] UK and Germany employed differing criteria for determining patent eligibility. In the UK, the assessment was centered around the "manner of new manufacture" concept, implying that the invention must produce a "vendible product" as the result. Additionally, the invention was required to demonstrate utility and an inventive step. In contrast, German courts held that patentable subject matter must involve a "technical effect" that contributed to an advancement in the state of the art.[110]

In 1960s, Europe started harmonizing the national patent systems, culminating in the adoption of the "Patent Cooperation Treaty" (PCT) in 1970. This marked a significant step towards unifying procedural aspects of patent application processes across jurisdictions. Prior to the adoption of the EPC in 1973, software was considered patentable under certain conditions in the United Kingdom, pursuant to the Patents Act 1949.[111] This position was notably reflected in the *Nymeyer* case, which demonstrated the UK's relatively liberal approach toward software-related inventions during that period.[112]

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[107] Id
[108] M Kikuchi, 'Patent Eligibility of Computer Software Patents in the United States, Europe and Japan' (2009) 16.3 CASRIP Newsletter
[109] Ibid
[110] Id
[111] P Leith, Software and Patents in Europe (Cambridge University Press, Cambridge 2007)11-18
[112] Id

Germany also adopted a relatively liberal stance toward the patentability of software. In 1973, shortly before the signing of the European Patent Convention, The German Federal Patent Court ruled that certain computer programs could be eligible for patent protection, as long as they generated a technical effect.[113] This reflected Germany's continued emphasis on the requirement of a technical contribution as the basis for patent eligibility.[114] The final phase commenced in 1973 following the signing of the European Patent Convention (EPC), which came into force in 1977. Prior to its implementation, both the United Kingdom and Germany had amended their patent laws to align with the substantive requirements of the EPC. By 1981, the patent laws of both countries included provisions that were largely identical to Article 52 of the EPC. During the harmonization process, Germany gradually aligned its approach with that of the United Kingdom by adopting the "inventive step" criterion and moving away from its traditional "Technical character" requirement. Despite these developments, the patentability of computer-implemented inventions remained a contentious issue. In response, a working group was established in 1984 to study the challenges surrounding such inventions. The group ultimately recommended that the European Patent Office (EPO) assess whether a claimed invention can determine[115]its exclusion under Article 52(2) EPC.[116] Following this recommendation, the EPO Guidelines for Examination were amended to incorporate the technical character approach, marking a significant shift in the interpretation of software patentability within the European framework.[117]

2.3.4 INDIA

In India, software is primarily protected under the Copyright Act, 1957, which classifies computer programs as "literary works" under Section 2(o)[118] and specifically defines a "computer programme" in Section 2(ffc).[119] Copyright protection grants the author

[113] L Ford, 'Alchemy and Patentability: Technology, 'Useful Arts,' and the Chimerical Mind-Machine' (2005)
[114] Id
[115] Matteo Dragoni, Software Patent Eligibility and Patentability: An Overview of the Developments in Japan, Europe and the United States and an Analysis of Their Impact on Patenting Trends, TTLF Working Papers No. 72, Stanford-Vienna Transatlantic Technology Law Forum (2021).

[117] Id
[118] The Copyright Act, No. 14 of 1957, § 2(o), India Code (1996)
[119] The Copyright Act, No. 14 of 1957, § 2(ffc), India Code (1996)

exclusive rights to use, reproduce, distribute, and license the software, thereby incentivizing creativity and investment in software development. [120] The scope of copyright protection extends to the expression of the software, including its code, structure, and sometimes graphical user interfaces, but not to the underlying ideas, algorithms, or functional aspects, This means that while the specific way a program is written is protected, the general concepts or methods it implements are not. To fully benefit from legal remedies—such as statutory damages or attorney fees in infringement cases—registration of the software copyright with the Indian Copyright Office is recommended, though not mandatory for protection.[121] Copyright for software in India lasts for 60 years from the date of publication. However, copyright does not extend to the functional or technical components of software; these elements may only qualify for patent protection if they exhibit a technical contribution or innovation.[122]

There is no legal or conclusive definition for software under Indian law. 'Section 3'[123] of the patents act, 1970 is an exclusion clause, section 3(k) excludes a 'mathematical or business method, a computer program per se, or algorithms' from getting patented.[124] In the digital age, the exclusion of the computer related inventions is a block to innovation and development of technology and to tackle the dilemma, the Computer - Related Inventions (CRI) guidelines were introduced in India, which may be considered to be a legal compass designed to navigate the grey waters between abstract software and tangible technological invention. Initially a Draft Guideline was published in 2013 by the `Office of the Controller General of Patents, Designs and Trademarks'.[125] The Guidelines consisted the draft provisions regarding the patentability of computer related inventions.[126] It included the background i.e. the statutory amendments in patent law in India, terms and definitions related to Computer Related Inventions- those which are

[120] Copyright for Software in India, Arctic Invent Blog (Oct. 11, 2024) https://www.arcticinvent.com/blog/copyright-for-software-in-india.
[121] Id
[122] Legal Protection for Computer Software in India, ProInd Blog (Apr. 5, 2021) https://www.proind.in/blog/legal-protection-for-computer-software-in-india/.
[123] The Patents Act, No. 39 of 1970, Section 3
[124] The Patents Act, No. 39 of 1970, Section 3(k)
[125] Office of the Controller General of Patents, Designs & Trade Marks, Draft Guidelines for Examination of Computer Related Inventions (CRIs) (2013) (India)
[126] Id

not mentioned in the Act and its examination procedure.[127] The Guidelines were intended to gain uniformity while dealing with the patent applications.

In 2016, India witnessed a significant shift in its approach to the patentability of software through the introduction of `Guidelines for Examination of Computer Related Inventions' (CRIs).[128] The new Guidelines reaffirm the exclusion of software patents and introduce a new three-step test for evaluating the patentability of Computer-Related Inventions (CRIs), reinforcing a stricter approach toward software-related patent applications.[129] A key highlight of this framework was the mandatory requirement for the inclusion of novel hardware in the patent claims. This meant that mere computer programs, algorithms, or software *per se* could not be patented unless they were integrally tied to a novel and inventive hardware component. This move was aimed at aligning with the exclusions under Section 3(k) of the Indian Patents Act, which bars the patenting of "a mathematical or business method or a computer program per se or algorithms".[130]

In 2017, a revised CRI Guideline was published replacing the 2016 Guidelines. The revised Guidelines are short and precise compared with the 2016 Guidelines and have relaxed the criteria for patentability of the CRIs. The three-step test that was formulated under the 2016 guidelines is removed from the 2017 Guidelines.[131] As per the 2017 Guidelines, it is essential to determine whether the invention possesses a technical character by demonstrating technical advancement or holds economic significance. Meeting either of these criteria is sufficient; fulfilling both is not mandatory.[132]

The *Ferid Allani case* is a landmark decision in Indian patent law, particularly concerning computer-related inventions.[133] Ferid Allani, a Tunisian innovator, filed a patent application in India in 2002 for a "Method and Device for Accessing Information

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[127] Id

[128] Guidelines for Examination of Computer Related Inventions 2016, No. 5, https://ipindia.gov.in/writereaddata/Portal/IPOGuidelinesManuals/1_83_1_Guidelines-for-Examination-of-CRIs-19-2-2016.pdf.

[129] Noto La Diega G (2016) Patents on Computer-Related Inventions in India. Intel Prop Rights. S1: 009. doi: 10.4172/2375-4516.S1-009

[130] Supra n.125

[131] Guidelines for Examination of Computer Related Inventions 2017,https://ipindia.gov.in/writereaddata/Portal/IPOGuidelinesManuals/1_86_1_Revised__Guidelines_for_Examination_of_Computer-related_Inventions_CRI__.pdf

[132] Id

[133] Ferid Allani v. Union Of India & Ors on 27 February, 2019, https://indiankanoon.org/doc/52000152/

Sources and Services on the Web," which aimed to provide efficient internet access without wasting resources like bandwidth. This was initially rejected by the IPO in 2008 under Section 3(k) of the Patents Act, Allani appealed to the Intellectual Property Appellate Board (IPAB), which also rejected it in 2013. He then petitioned the Delhi High Court, which directed the IPO to reconsider the application based on technical effect and contribution. Finally, the IPAB granted the patent on July 20, 2020, recognizing its technical contribution and effect. This case has influenced Indian patent law by establishing that software-related inventions can be patentable, provided they result in a technical effect, such as enhanced processing speed or more efficient memory usage. The decision has boosted software patents in India, aiming to provide clarity and encourage innovation in the tech sector. It aligns Indian patent standards with international practices, emphasizing the importance of technical contributions beyond mere computer programming. The case has set a precedent for future patent [134] Despite the positive direction, the courts and IPAB declined to clearly define what constitutes "technical advancement" or "technical effect," leaving significant ambiguity for future applicants and examiners. The Allani case exemplified the lengthy and cumbersome process for software patent applicants in India, with the patent being granted nearly 20 years after filing—just months before its expiry—highlighting inefficiencies in the system. The lack of a precise standard means that the patentability of software-related inventions in India remains unpredictable and subject to varying interpretations by different examiners and [135][136]

2.4 SOFTWARE UNDER TRIPS

Under the TRIPS agreement, Article 10 explicitly includes computer software under copyright protection, covering both source code and object code. [137] TRIPS sets minimum standards for copyright protection, which must be adhered to by all WTO

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[134] Id

[136] Antony Moses, Curtain Call For Computer Related Inventions in India: An Analysis of the Ferid Allani Case, IPWatchdog (July 25, 2020), https://ipwatchdog.com/2020/07/25/curtain-call-computer-related-inventions-india-analysis-ferid-allani-case/id=123483/.
[137] World Trade Organization, TRIPS Training Module 2: Standards and Principles Concerning the Availability, Scope and Use of Intellectual Property Rights, https://www.wto.org/english/tratop_e/trips_e/ta_docs_e/modules2_e.pdf

member countries. These standards include a minimum term of protection and specific rights granted to copyright holders. [138] The TRIPS agreement does not have an explanatory tone regarding the patentability of software. However, Article 27 allows room for interpretation by stating that patents should be granted for inventions in all fields of technology, as long as they satisfy the requirements of novelty, inventive step, and industrial applicability. [139]

2.5 CONCLUSION

Software patentability has long been a controversial topic in intellectual property law, with different countries taking different stances on its defence. Determining the extent of software patents has become crucial for promoting innovation without inhibiting technological advancement as digital technologies develop quickly and software becomes a fundamental component of innovation across industries. By stressing the subtle variations in legislative interpretation, judicial procedures, and policy justifications, this conclusion aims to synthesize the knowledge of software under the patent regimes of the US, UK, EU, and India.

The definition of software, whether it is a simple mathematical formula, an abstract concept, or a technological process with observable results is at the centre of the argument. Abstract concepts, mathematical formulas, and mental processes are not patentable under traditional patent regimes. Determining when and how software evolves from an abstract concept into a patentable invention has proven difficult because, in its most basic form, software frequently resembles a series of instructions or algorithms.

In the United States, software patents have been largely shaped by judicial interpretations rather than legislative amendments. Under 35 U.S.C. §101, any "new and useful process, machine, manufacture, or composition of matter" is patentable, but the U.S. Supreme Court's jurisprudence has introduced significant limitations. The *Alice Corp* decision established a two-step framework for determining patent eligibility. Initially, courts determine if the claim pertains to a subject matter that is not eligible for

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[138] World Trade Organization, Overview: The TRIPS Agreement, https://www.wto.org/english/tratop_e/trips_e/intel2_e.htm
[139] World Trade Organization, TRIPS Training Module 5: Enforcement of Intellectual Property Rights, https://www.wto.org/english/tratop_e/trips_e/ta_docs_e/modules5_e.pdf

patent protection, such as an abstract idea. Next, they evaluate whether the claim includes an "inventive concept" that is enough to convert it into a patent-eligible application. This test, while pivotal in preventing monopolization of basic algorithms and business methods, has led to inconsistent outcomes and increased uncertainty for applicants. The U.S. Patent and Trademark Office has attempted to clarify this through guidelines, emphasizing that software can be patentable if it demonstrates a specific technical improvement or is tied to a particular machine or transformation. However, the ambiguity in what constitutes an "inventive concept" continues to fuel debate, leaving the U.S. software patent regime relatively broad in potential scope but fraught with unpredictability.

In contrast, UK and EU adopt a more restrained approach, guided by the requirement of technical contribution. In the UK, the Patents Act 1977, which aligns with the European Patent Convention (EPC), excludes "a program for a computer" as such from patentability. However, this exclusion is not absolute. The seminal decision in *Aerotel v. Telco Holdings* introduced a four-step test to determine patentability, including the critical step of identifying whether the claimed invention provides a technical contribution to existing knowledge. The European Patent Office (EPO) takes a comparable approach under Article 52 of the EPC, which excludes software "as such" from patentability but allows patents if the software contributes to the technical character of the invention. For instance, the decision in T 1173/97 (Computer program product/IBM) clarified that a computer program is patentable if it generates a technical effect beyond the standard physical interaction between software and hardware. This framework ensures that software patents in the EU are granted only when they address a technical problem in an innovative and non-obvious manner, resulting in protection that is generally more predictable but narrower compared to the U.S. system.

India presents one of the most restrictive jurisdictions concerning software patents. Section 3(k) of the Indian Patents Act, 1970, explicitly excludes "a mathematical or business method or a computer program per se" being patentable. The phrase "per se" has been subject to interpretation, with the Indian Patent Office (IPO) and judiciary emphasizing that software, to be patentable, must be intrinsically linked to hardware or demonstrate a "technical effect." Guidelines issued in 2016 and reflected a strict stance, wherein software embedded in a novel hardware configuration might be considered

patentable, but standalone software is typically not. While this approach has been criticized for limiting the protection available to domestic software developers, it is reflective of India's broader policy objective of preventing monopolization in the burgeoning tech sector and safeguarding public interest. Recent calls for reform indicate an ongoing debate, with stakeholders advocating for clarity and modernization of India's patent law considering global practices. The 2017 Guidelines provided a liberal stand than the 2016 guidelines, but the inconsistency in the legal framework makes it difficult to the innovators.

In conclusion, the definition and scope of software within patent regimes reflect each jurisdiction's legal traditions, economic priorities, and technological aspirations. While software may not always qualify for patent protection, when it forms part of a technical process or yields a novel and inventive technical solution, it stands a greater chance of being protected—albeit with significant variation across borders. As the global digital economy becomes increasingly integrated, there is a compelling case for greater international dialogue and cooperation to ensure that patent systems remain robust, fair, and innovation-friendly across jurisdictions.

CHAPTER - 3

LEGAL FRAMEWORK FOR SOFTWARE IN THE INDIAN REGIME

3.1INTRODUCTION

The legal framework that governs software in India is a dynamic and complex area that aims to achieve a balance between fostering technological advancement and protecting innovation. Protecting software as an intellectual property has become crucial in a time when it powers the digital revolution of businesses, daily life, and industries. The main way that India's legal system handles software protection is by combining provisions of copyright law, patent law, trade secret protections, and IT Act, 2000. each of which adds a different level of security and regulation. Software is no longer just a technical tool but a vital intellectual asset that requires robust legal safeguards to encourage innovation, protect investments, and maintain a competitive edge in the global market. However, India's legal approach to software protection remains cautious, fragmented, and sometimes unclear, reflecting the complexities of balancing innovation, access, and public interest.

The Indian law did not recognise software as a distinct subject requiring special legal protection. Late 20th century witnessed a global development in the field of computer technology; India felt the need to develop a framework to address this growth of computer programs. The Copyright act, 1957 is the base of protection of software in India.[140] The Copyright Act categorises software as a form of "literary work". The amendment made in the Act in 1994 was a major step in bringing computer programs within the ambit of copyright protection that grants creators exclusive rights over their works.[141] This move aligned Indian law more closely with international standards, particularly the 'TRIPS' Agreement under the World Trade Organization, which mandates the protection of computer programs as literary works.[142] Copyright protection offers software developers certain rights, including the right to reproduce, distribute, and modify their software. However, it protects only the specific form of

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[140] The Copyright Act, No. 14 of 1957.
[141] The Copyright(amendment) Act,1994(Act no.38 of 1994)
[142] Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299.

expression — the actual lines of code — and not the underlying ideas, methods, or functional principles.[143]

When it comes to patent protection, India's stance is notably more restrictive and ambiguous. The Patents Act, 1970 explicitly excludes "computer programs per se" from patentability under Section 3(k).[144] The underlying idea is to prevent monopolization of abstract concepts, algorithms, or business methods, which could otherwise hinder further innovation and competition. Software, being essentially a set of instructions, is often viewed as falling within these excluded categories. However, the law leaves room for interpretation, particularly in cases where software is combined with novel hardware or demonstrates a tangible technical effect. Patent office Guidelines on Computer Related Inventions (CRIs) and judicial decisions have indicated that software can, under certain conditions, be patented if it results in a "technical contribution" or solves a "technical problem" in a novel manner. [145] For instance, in the case of *Telefonaktiebolaget LM Ericsson v. Intex Technologies[146]* issues surrounding Standard Essential Patents (SEPs) and software innovation highlighted the need for more nuanced interpretations. Nevertheless, the patentability of software remains a grey area, leading to considerable uncertainty for inventors and businesses operating in India.

Beyond copyright and patent law, the Information Technology Act, 2000 [147] also indirectly contributes to the legal environment surrounding software. While the IT Act does not specifically create intellectual property rights, it facilitates the legal recognition of digital contracts, electronic signatures, and cybersecurity measures.[148] It plays an important role in addressing offences such as hacking, identity theft, and unauthorized access to software systems, thereby offering another layer of protection in the digital domain.[149]

The legal framework for software in India is a work in progress — a patchwork of copyright protections, cautious exclusions from patentability, and broader regulatory

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[143] The Copyright (Amendment) Act, No. 38 of 1994, section 2(ffc)
[144] The Patents Act, No. 39 of 1970, Section 3(k)
[145] Office of the Controller General of Patents, Designs and TradeMarks, Guidelines for Examination of Computer-Related Inventions (CRIs), 2017 (India).
[146] Telefonaktiebolaget LM Ericsson v. Intex Technologies, 2023 SCC OnLine Del 8616
[147] THE INFORMATION TECHNOLOGY ACT, 2000 (ACT NO. 21 OF 2000)
[148] Id
[149] Id

structures aimed at managing the digital environment. While India has made important strides in aligning its laws with international obligations, significant gaps and ambiguities remain, particularly in relation to the patentability of software innovations. As India aspires to cement its place as a leading digital economy, it must evolve its legal approach to better support software innovation while maintaining a fair and balanced system that serves both creators and the broader public interest. Addressing these challenges will be essential to building a legal environment that fosters technological growth, encourages entrepreneurship, and upholds India's reputation as an IT powerhouse.

3.2 COPYRIGHT PROTECTION FOR SOFTWARE

India copyright law is governed by the Copyright Act,1957 [150] as it serves as a cornerstone for protecting creative expressions. Enacted in the early years following India's independence, the legislation has been periodically updated to align with new advancements and evolving creative landscapes. A particularly significant revision occurred in 2012, which introduced key provisions to address the complexities arising in the digital environment. Historically, the Act concentrated on safeguarding conventional types of intellectual property, including literary works, artistic creations, musical compositions, and films. The concept of copyright in India has roots that stretch back to the colonial period under British rule. The first formal copyright law in India was the Copyright Act of 1847, enacted during the East India Company's time. This law was largely modelled on the U.K. Copyright Act of 1842 and primarily aimed to protect the rights of British authors in India However, with the progression of technology, the scope of protection under the Act has broadened to encompass more contemporary and technical forms of creativity.[151] In 1911, the UK Copyright Act was extended to all British colonies, including India. This was soon followed by the Indian Copyright Act of 1914, which adapted the 1911 UK law to Indian conditions and introduced criminal sanctions for infringement. The 1914 Act provided copyright protection for literary and artistic works and established a registration system.[152]

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[150] Copyright Act,1957(act no.14 of 1957)

[151] Suvrashis Sarkar, History and Evolution of Copyright in India, 5(11) PARIPEX – INDIAN J. RES. 274 (2016), https://www.worldwidejournals.com/paripex/recent_issues_pdf/2016/November/history-and-evolution-of-copyright-in-india_November_2016_8201054601_2910081.pdf.

[152] Id

After gaining independence, India enacted its own comprehensive copyright legislation: the Copyright Act, 1957. This law came into effect on 21 January 1958 and replaced the colonial-era laws.[153] The 1957 Act broadened the range of protected works to cover literary, dramatic, musical, and artistic creations, along with cinematograph films and sound recordings. It also established the Copyright Board to resolve disputes and oversee copyright matters.[154]

In addition to encouraging people to develop other people's ideas, copyright safeguards writers' rights to original expression of their thoughts.[155] How courts distinguish between ideas and expression has a direct bearing on the extent of copyright protection that courts have granted to computer programs. The protection that copyright law affords computer programs has grown over time. The written code that comprised a computer programme was protected by the Copyright Act initially. The court broadened the protection of nonliteral structure and organization of computer programs.[156]

The TRIPS Agreement, under 'Article 10(1)'[157], mandates that computer programs, even it is in source code or object code, must be protected as literary works[158] within the framework of the Berne Convention. This recognition establishes that software is eligible for copyright protection in the same manner as traditional literary creations. Accordingly, all WTO member states are obligated to provide such protection without the need for registration or other formalities. This provision ensures that software developers and rights holders are granted exclusive rights over the reproduction, adaptation, and distribution of their code.[159]

Under Indian law, to protect software, a copyright application must be submitted along with the source code and object code in a machine-readable format should be filed. In Rule 70(5) Copyright Rules [160] the significance of including both source code and

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[153] Copyright Office, About Us, https://copyright.gov.in/Aboutus.aspx (last visited May 04, 2025).
[154] Id
[155] Feist Publications, Inc. v. Rural Tel. Serv. Co., 499 U.S.340 (1991),https://supreme.justia.com/cases/federal/us/499/340/
[156] Johnson Controls V. Phoenix Control Sys, 886 F.2d 1173, 1175 (9th Cir. 1989)
[157] Agreement on Trade-Related Aspects of Intellectual Property Rights art. 10(1), Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299.
[158] Id
[159] India, IP Developments and TRIPs, 10 INTELL. PROP. L. & POL'y 971 (2008).
[160] Copyright Rules, 2013, Rule 70(5), Gazette of India, pt. II, sec. 3(i) (Mar. 14, 2013) (India).

object code has been emphasized when submitting applications for the registration of computer programs is stated.[161]

Section 2(ffc)[162] of the Copyright act states that ""*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".* [163] This definition covers instructions in any form (words, codes, schemes, etc.), instructions that can be stored in a machine-readable medium and the purpose is to make a computer perform a specific task or achieve a defined result.[164]

Section 2(o) of the act defines the term 'literary work' as *"literary work" includes computer programmes, tables and compilations including computer databases."* [165]The term "literary work" is defined inclusively, not exhaustively — meaning it not only includes traditional forms like novels, poems, and essays, but also Computer programmes, Tables, Compilations including Computer databases. This categorization, though seemingly academic, has profound implications: it means that software is protected not for the idea it represents, but for the original expression of that idea—the unique way the code is written. Consequently, Indian copyright law safeguards the code from unauthorized reproduction, distribution, and adaptation, while still leaving the functional aspects of software vulnerable unless separately protected under patent law.[166]

The Copyright Act does not extend protection to the non-literary functioning of the said software. In *University of London Press Ltd v University Tutorial Press Ltd,* [167] Justice Peterson ruled that, while substantial copying of a work is illegal, adopting the work's central idea does not constitute an infringement. The Allahabad High Court relied on the observations of Justice Peterson in *Shyam Lal Paharia v. Gaya Prasad Gupta*[168] .

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[161] Id
[162] Copyright Act, No. 14 of 1957, § 2(ffc), INDIA CODE (1957),
https://www.indiacode.nic.in/handle/123456789/1794.
[163] Id
[164] Id
[165] The Copyright Act, 1957, § 2(o) (India).
[166] Id

[167] University of London Press Ltd v. University Tutorial Press Ltd, 1916-2 Ch. D. 601
[168] Shyam Lal Paharia v. Gaya Prasad Gupta, 1970 SCC Online All 260 : AIR 1971 All 192

In the case of software, it can be interpreted that the central idea behind the software will always be at a risk of being copied. There is a possibility of another individual adopting the central idea of the software and creating a different source code which could generate similar results as the original software. As a result, the Indian Copyright Laws do not provide protection for the idea behind the work, but only the expression.[169]

In *Microsoft Corpn. v. Yogesh Papat*[170] ,Microsoft claimed that the defendant, who was in the business of selling assembled computers, was loading software in which the plaintiff had a copyright without a licence on the hard discs of computers being sold. By indulging in such activity, the defendant was infringing the plaintiff copyright financial loss to the plaintiff. The Delhi High Court granted injunctions against the unauthorised use and distribution of Microsoft software, reinforcing the idea that both source code and object code are protected under copyright law in India. This case underlined that even unauthorised installation of software constitutes copyright infringement.[171]

Adobe Systems, Inc. & Anr. v. Mr. Mahindra Saxena & Anr[172] was adjudicated by the Delhi High Court on July 7, 2009. It addressed significant issues concerning software piracy, copyright infringement, and the enforcement of intellectual property rights in India. Mahindra Saxena and his company were sued by Adobe Systems Inc. and Microsoft Corporation for allegedly using their copyrighted software without authorization. In February 2002, the plaintiffs were informed of the defendants' infringement actions via the BSA/NASSCOM anti-piracy hotline. Following a raid on the defendants' property by a local commissioner authorized by the court, 23 PCs and 17 DVDs containing pirated software, such as Adobe Photoshop, Microsoft Office, and Macromedia programs, were found. The court held that the defendants wilfully infringed the plaintiffs' copyrights and trademarks by using pirated software. The court emphasized that such actions not only harm the rights of the software companies but also deceive the public and result in significant revenue losses for the government. This case is notable for reinforcing the protection of software as a "literary work" under

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[169] Ania Jedrusik and Phil Wadsworth, Patent protection for software-implemented inventions, WIPO Magazine (2017).
[170] Microsoft Corpn. v. Yogesh Papat, 2005 SCC OnLine Del 216
[171] Id
[172] Adobe Systems, Inc. & Anr. v. Mr. Mahindra Saxena & Anr. (2009 SCC OnLine Del 1831)

Section 2(o) of the Copyright Act, 1957 and recognizing computer programs under Section 2(ffc). It also underscores the Indian judiciary's commitment to awarding punitive damages in intellectual property infringement cases to deter wilful violators. [173]

In India, copyright law plays a pivotal role in safeguarding software by categorizing it as a "literary work" under the Copyright Act, 1957. This classification grants authors exclusive rights over the reproduction, distribution, and modification of their software. However, while copyright ensures protection of the source code and expression of ideas, it falls short in addressing functional aspects and technological innovations within software—areas typically covered by patent law. As software continues to evolve as a crucial economic and technological asset, there is a pressing need to reconsider and possibly reform India's intellectual property framework to provide more robust and balanced protection, ensuring innovation is encouraged without stifling competition or interoperability.

3.3 PATENT PROTECTION FOR SOFTWARE

The Patent Act, 1970[174] is the legal framework that governs the patent protection in India. It replaced the earlier Indian Patents and Designs Act of 1911, aligning India's patent system with its developmental needs, and later, with international norms, particularly those under the TRIPS Agreement (Trade-Related Aspects of Intellectual Property Rights). India's first patent law, Act VI of 1856, aimed to encourage useful inventions and public disclosure by inventors. It was repealed in 1857 due to lack of British Crown approval. A revised law, Act XV of 1859, limited rights to useful inventions, extended the priority period to 12 months, and excluded importers as inventors. Based on the UK Patent Act of 1852, it also allowed assignees to apply and considered prior public use in India or the UK to assess novelty. In 1872, the Act of 1859 was consolidated and renamed as "The Patterns and Designs Protection Act" to cover design protection. It was amended in 1883 to include a provision safeguarding the novelty of inventions displayed at the Exhibition of India, allowing a 6-month grace period for filing applications after the exhibition's opening. The Act remained unchanged for about 30 years. Following modifications to patent law in the United

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[173] Id

[174] The Patents Act, No. 39 of 1970.

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Kingdom in 1883, India introduced a new Act in 1888 to consolidate and amend its law on inventions and designs in line with those UK changes.[175]

The Indian Patents and Designs Act, 1911 replaced earlier laws and introduced the Controller of Patents. Later several amendments took place and in 1970, The Patents Act was passed.[176] The Patents Act has undergone several significant amendments—most notably in 1999, 2002, and 2005—to bring Indian law in line with the World Trade Organization (WTO) obligations.

The objectives of the Patent Act in India are rooted in promoting innovation, technological advancement, and balancing the interests of inventors and the public. The primary objective of the Patent Act is to foster innovation and scientific research by providing inventors with exclusive rights over their inventions for a limited period. This exclusivity acts as a financial incentive, motivating individuals and organizations to invest time and resources in developing new products, processes, or technologies. In exchange for monopoly rights, inventors are required to fully disclose the technical details of their inventions. This disclosure enriches the public domain, allowing others to learn from, build upon, or further improve existing technologies, thereby accelerating overall technological progress. Patent law safeguards the interests of inventors by granting them exclusive rights to make, use, sell, or license their inventions. This protection helps prevent unauthorized exploitation or infringement, ensuring inventors can reap the commercial benefits of their work. The Indian Patent Act aligns with international agreements (such as TRIPS) to provide protection for inventions in foreign markets, facilitating international trade and cooperation in technology.[177] According to section 2(j) of The Patent Act, 1970, "invention" is defined *as a new product or process involving an inventive step and capable of industrial application.*[178] It should be noted that an invention is not just a novel product or a process, but it should also involve an inventive step, and it should be capable of working industrially.[179] Therefore, there are

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[175] Office of the Controller General of Patents, Designs & Trade Marks, History of Indian Patent System, Intellectual Property India, https://ipindia.gov.in/history-of-indian-patent-system.html (last visited May 04, 2025).
[176] Id
[177] Office of the Controller General of Patents, Designs & Trade Marks, Vision Statement, Intellectual Property India, https://ipindia.gov.in/vision-patent.html (last visited May 22, 2025).
[178] The Patents Act, No. 39 of 1970, § 2(j), India Code (1970).
[179] Id

three criteria/parameters laid down in The Patent Act, 1970 for an invention, i.e. Novelty, non-obviousness and utility/industrial application.

The Indian legal approach to software patents is restrictive and cautious initially. The amendments made in 2002 and 2005 brought the provision of exclusion of computer programmes. Chapter 2 of the act describes inventions not patentable under the act.[180] The core provision regarding the patentability of software lies in Section 3(k) of the Patents act, 1970.[181] According to section 3(k),`*a mathematical or business method or a computer programme per se or algorithms* 'are excluded from inventions. [182]

The phrase "*computer programme per se*" means that a computer program by itself, without any technical application or effect, is not patentable. However, if a computer program produces a technical effect beyond the normal interaction with a computer, it may be considered for patentability[183]. Section 3(k) remains one of the most debated provisions in Indian patent law, especially regarding software and computer-implemented inventions. The interpretation of what constitutes a "*technical effect*" or a "*computer programme per se*" continues to evolve through case law and administrative guidelines. The key question is whether it refers to all types of software or only to foundational software like programming platforms. If it means all software, patents on software are generally not allowed. If it refers only to basic platforms, only those are excluded from patent protection to avoid hindering innovation. [184]

In the case of *Accenture global GMBH, Switzerland v. Assistant Controller of Patents and Design Office*[185] The Intellectual Property Appellate Board had held that the patent for a system for developing internet-hosted web services and software was novel and would not fall under section 3(k) of the Indian Patents Act. However, in the said case, the Appellate Board did not provide any clarity on what conditions must be considered,

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[180] The Patents Act, No. 39 of 1970, § 3, India Code (1970), https://ipindia.gov.in/writereaddata/Portal/ev/sections/ps3.html (last visited May 22, 2025).
[181] The Patents Act, No. 39 of 1970, Section 3(k), India Code (1970), https://legislative.gov.in/sites/default/files/A1970-39.pdf.
[182] Id
[183] World Intellectual Property Organization, Legislative Implementation of Flexibilities – WIPO Development Agenda Database, https://www.wipo.int/ip-development/en/agenda/flexibilities/details.jsp?id=8825 (last visited May 22, 2025).
[184] Adithya Banavar, Patenting of Computer Related Inventions: A Look at Bilsky and its Applicability in the Indian Scenario, 5 J. INT'l COM. L. & TECH. 90 (2010).
[185] Accenture global GMBH, Switzerland v. Assistant Controller of Patents and Design Office ,2012 SCC Online IPAB 192

while analysing a computer programme or software patent application, to understand why a patent application would or would not fall under the ambit of section 3(k) of the Act.[186]

The ambiguity surrounding the patentability of computer programs/software necessitated the need for greater clarity on the issue. The Office of the Controller General of Patents, Designs and Trademarks had prepared guidelines for the examination of patent applications in the field of Computer Related Inventions to foster uniformity and consistency in the examination of such inventions. The first draft document was released in 2013 as Guidelines for examination of Computer Related Inventions (CRIs).[187] The Purpose of the guidelines was to provide a clear framework for patent examiners to determine the patentability of inventions involving computer programs or software and to ensure uniformity and consistency in examination practice.[188]

Crucially, the guidelines focused on interpreting the phrase "*per se*" in Section 3(k)[189], which had been the subject of considerable legal debate. The guidelines attempted to distinguish between pure software inventions which are not patentable—and inventions that incorporate a computer program in conjunction with a technical application or hardware, which could be considered for patent protection. The 2013 CRI Guidelines emphasized that for a computer-related invention to be patentable, it must demonstrate technical advancement and/or result in a technical effect. Inventions that merely automate known manual processes using software, or those that consist of abstract algorithms, were not considered patentable. For example, claims directed solely at a source code, mathematical method, or business model implemented through software would be rejected.[190]

However, if the invention included hardware components, such as in embedded systems, or if it offered a tangible technical solution, like improved memory

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[186] Id

[187] Office of the Controller General of Patents, Designs & TradeMarks, Draft Guidelines for Examination of Computer Related Inventions (CRIs) (2013), https://ipindia.gov.in/IPIndiaAdmin/guidelines-patents.html

[188] Id

[189] The Patents Act, No. 39 of 1970, § 3(k), India Code (1970).

[190] Office of the Controller General of Patents, Designs & TradeMarks, Draft Guidelines for Examination of Computer Related Inventions (CRIs) (2013), https://ipindia.gov.in/IPIndiaAdmin/guidelines-patents.html

management, enhanced data security, or better system architecture it might qualify for patent protection. The guidelines also stressed that patent claims must be drafted to highlight technical features and not merely describe abstract or administrative processes.[191]

The examination process outlined in the guidelines involved a careful evaluation of the substance of the invention, not just its form. Patent examiners were instructed to scrutinize whether the claimed invention truly solved a technical problem or merely performed a business or organizational function using conventional computing means. The guidelines made brief references to international practices, including those followed by the European Patent Office (EPO) and the United States Patent and Trademark Office (USPTO). However, they made it clear that Indian law, particularly the scope of Section 3(k), would remain the guiding standard for patentability determinations.[192] While the 2013 CRI Guidelines were a step forward in providing a structured approach to examining software-related patents, they were widely criticized for being overly restrictive and lacking clarity. Stakeholders in the software and IT industry argued that the guidelines discouraged innovation by creating uncertainty and inconsistency in patent grant decisions. The 2013 Guidelines for Examination of Computer Related Inventions represented an important effort by the Indian Patent Office to regulate the complex and evolving domain of software patenting. By attempting to provide clarity on the application of Section 3(k), the guidelines aimed to balance the twin objectives of protecting genuine technological innovations and preventing monopolies over abstract ideas. Although the initial framework faced criticism, it laid the groundwork for a more nuanced understanding of computer-related inventions. [193]

In 2015, Guidelines for Examination of Computer Related Inventions (CRIs) in India were introduced to clarify patentability criteria but faced significant criticism and were eventually revised. The guidelines defined CRIs as inventions involving computers,

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[191] Id

[192] Office of the Controller General of Patents, Designs & TradeMarks, Draft Guidelines for Examination of Computer Related Inventions (CRIs) (2013),p no. 16, https://ipindia.gov.in/IPIndiaAdmin/guidelines-patents.html

[193] Choudhary K (2013) Draft Guidelines for Examination of Computer Related Inventions. Office of Controller General of Patents, Designs and Trademarks.

networks, or programmable apparatus with features realized wholly/partially via computer programs. It Aimed to assess whether inventions demonstrated technical effect or technical contribution, aligning with Section 2(1)(ja)[194] of the Patents Act (defining "inventive step" as technical advancement or economic significance). Stakeholders argued the guidelines diluted Section 3(k), which excludes "computer programs per se," mathematical/business methods, and algorithms from patentability. The 2015 guidelines were seen as enabling software patents if they showed technical advancement, contrary to Section 3(k)'s intent. After backlash, the guidelines were suspended in late 2015 for stakeholder consultations.[195]

In 2016, the Guidelines for Examination of Computer Related Inventions (CRIs)[196] was published which marked an important shift from the previous one in which a stricter approach was taken regarding the software patents. The 2016 Guidelines introduced a three-step test as follows:

Step 1: Identify the "substance" of the claim (e.g., algorithm, business method).

Step 2: Check if the claim falls under excluded categories (e.g., "computer program per se" under Section 3(k)).

Step 3: Allow patents only if the invention demonstrates a technical contribution (e.g., novel hardware or technical effect)[197]

The three-step test introduced in India's 2016 CRI Guidelines was a structured framework for evaluating computer-related inventions, designed to align with Section 3(k) exclusions (e.g., software "per se"). First, it required examiners to identify the invention's core contribution (e.g., algorithm or hardware innovation). Second, it mandated rejecting claims if the contribution fell solely under excluded categories like mathematical methods or business models. Third, if the claim involved software, it demanded proof of novel hardware integration to proceed with patentability checks

[194] The Patents Act, No. 39 of 1970, § 2(l)(ja), India Code (1970).
[195] Lakshmikumaran & Sridharan, Patenting Computer-Related Inventions in India: A Historical Perspective (2015-16) 13.
[196] Office of the Controller General of Patents, Designs & Trade Marks, Guidelines for Examination of Computer Related Inventions (CRIs) (2016)
[197] Id

(novelty, inventive step).[198] Also, CRIs involving software had to show novelty in hardware components alongside software innovations.[199]

The 2016 Guidelines faced criticisms as the novel hardware mandate led to rejections even for inventions combining existing hardware with innovative software. Stakeholders argued the guidelines conflicted with judicial precedents emphasizing technical effect over hardware novelty. The 2016 guidelines were a short-lived attempt to clarify CRI patentability but were ultimately deemed impractical and legally inconsistent.[200]

The criticisms faced by the 2016 Guidelines paved the way for a new Guideline. Guidelines for Examination of Computer Related Inventions (CRIs) 2017[201] by Office of the Controller General of Patents, Designs and Trademarks replaced the 2016 Guidelines. The most notable feature of the recent Guideline is that it has done away with the three-step examination process of the previous guidelines. The recent document does not refer to novel hardware for granting patent. The revisions have been carried out with great attention and even subtle or implicit references to hardware have been removed. For example, paragraph 4.4.5 of the 2016 Guidelines contained two references to the "implementation" of claim inventions. These have now been replaced by the word "performance". [202] Implementation presupposes hardware, while performance does not. Like traitors in Ancient Rome or the intelligentsia in Stalinist Russia, the novel hardware requirement seems to have been killed and buried in an unmarked grave, purged completely from official memory.'[203]The 2017 Guidelines for Examination of Computer-Related Inventions (CRIs) marked a significant shift in India's approach to software patentability by focusing on technical contributions rather than hardware novelty. The guidelines removed the contentious requirement for novel hardware (present in the 2016 version) and emphasized that CRIs must demonstrate a technical effect (e.g., solving technical problems, enhancing processes) or technical

[198] Id
[199] Rajnish Kumar Singh, Patenting Computer Related Inventions: India in Comparison with US and UK, 10(1) Delhi L. Rev. 21 (2018).
[200] Id
[201] Office of the Controller General of Patents, Designs & TradeMarks, Revised Guidelines for Examination of Computer Related Inventions (CRIs) (2017)
[202] Id
[203] Balaji Subramanian, Patent Office Reboots CRI Guidelines Yet Again: Removes "novel hardware" Requirement,availableat:https://spicyip.com/2017/07/patent-office-reboots-cri-guidelines-yet-again-removes-novelhardware-requirement.html

contribution (e.g., improved functionality of hardware through software). The guidelines incorporated principles from the *Ferid Allani v. Union of India* [204]ruling, which clarified that inventions involving software could be patentable if they exhibited technical advancements, even without novel hardware. The 2017 guidelines discarded the three-step test and negative examples from the 2016 version, opting for a holistic evaluation of claims to determine if they transcend "computer programs per se" under Section 3(k).

Yet the ambiguity remains in matters relating to software patents. The guidelines require inventions to demonstrate technical effect (e.g., solving a technical problem) or technical advancement (e.g., improved efficiency), but fail to clearly define these terms. This leads to inconsistent examiner decisions, as seen in cases where similar inventions (e.g., data separation methods) received conflicting outcomes.[205] An example is Patent 277965 was granted for software separating user/system data without novel hardware, contrary to earlier norms, highlighting inconsistent enforcement.[206] While Section 3(k) excludes "computer programs per se," the guidelines do not clarify what qualifies as a non-excluded technical contribution. This creates uncertainty for inventions combining software with existing hardware. Courts have inconsistently interpreted Section 3(k), with some decisions emphasizing technical effect, while others reject claims for lacking hardware novelty.[207]

'Ferid Allani v. Union of India' [208] is a landmark in the evolution of software patentability in India. Ferid Allani had filed a patent application[209] in 2002 for a device to access information on the internet, which the Indian Patent Office initially rejected, citing it as a "computer program per se" and therefore excluded under Section 3(k) of the Patents Act, 1970. After unsuccessful appeals to the Intellectual Property Appellate

[204] Ferid Allani v. Union of India & Ors., W.P.(C) No. 7 of 2014, 2019 SCC OnLine Del 11867 (Delhi High Court Dec. 12, 2019).
[205] Prabhat Kumar, Jaya Pandeya & Ankur Garg, Patentability of Computer Related Inventions – Court's Inconsistent Approach Underscores Complexity but Creates Uncertainty, Lakshmikumaran & Sridharan (Dec. 17, 2024), https://www.lakshmisri.com/insights/articles/patentability-of-computer-related-inventions-court-s-inconsistent-approach-underscores-complexity-but-creates-uncertainty/.
[206] Ranjul Malik & Ekamjot Singh Bagga, Ambiguity in Patenting of Computer Related Inventions (CRIs), The IP Law Post (Sept. 16, 2021), https://iplawpost.wordpress.com/2021/09/16/ambiguity-in-patenting-of-computer-related-inventions-cris/.
[207] Id
[208] Ferid Allani v. Union of India & Ors., W.P.(C) No. 7 of 2014, 2019 SCC OnLine Del 11867 (Delhi High Court Dec. 12, 2019).
[209] IN/PCT/2002/705/DEL

Board, the case reached the Delhi High Court, which, in a landmark 2019 ruling, clarified that not all computer programs are excluded from being patentable. The Court held that software inventions demonstrating a "technical contribution", or "technical effect" may be patentable and emphasized that Section 3(k) should not be interpreted narrowly, especially in the context of evolving technology and India's TRIPS obligations. Despite the Court's directions, the IPO again refused the application in February 2020. Allani appealed to the IPAB, which, in July 2020, finally granted the patent, acknowledging that the invention solved a technical problem and provided a significant technical contribution to the state of the art, especially considering the technological context of 1999. This case played a vital role in shaping the Indian Patent Office's 2017 Guidelines for Examination of Computer-Related Inventions (CRIs). The case established that computer-related inventions demonstrating technical effect or contribution are not automatically excluded from patentability under Section 3(k). Although the final judgment came later, the legal questions raised during the Allani proceedings directly influenced the development of the 2017 CRI Guidelines, which introduced criteria such as the presence of technical advancement to assess patentability.[210]

After Ferid Allani, Delhi High Court in '*Microsoft Technology Licensing LLC v. The Assistant Controller of Patents and Designs*'[211] held that "[i]f the subject matter is implemented on a general-purpose computer but results in a further technical effect that improves the computer system's functionality and effectiveness, the claimed invention cannot be rejected as non-patentable for being a 'computer programme per se"[212] and directed the controller of patents to reassess the examination of the patent.

In *Idemia Identity and Security France v The Controller General of Patents, Designs and Trademarks*[213]the Madras High Court remanded application back to the Controller of Patents for reconsideration, emphasizing technical contribution.

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[210] Id

[211] Microsoft Tech. Licensing, LLC v. Assistant Controller of Patents & Designs, 2023 SCC OnLine Del 3748.

[212] Id

[213] Idemia Identity & Security France v. Controller Gen. of Patents, Designs & Trademarks, (T) CMA (PT) No. 198 of 2023, (T) CMP (PT) No. 21 of 2023 (Madras HC Nov. 12, 2024), https://indiankanoon.org/doc/69182521/.

In '*Blackberry Limited v. The Assistant Controller of Patents and Designs*'[214] the Court acknowledged that a "technical effect" was being produced but was rooted in the algorithms and nothing else and thus was not patentable. Therefore, the extent and scope of the "technical effect" required for patentability requires determination on a case-by-case basis.[215]

In March 2025, the Office of the Controller General of Patents, Designs and Trademarks proposed a new draft guideline that is intended to replace the existing guidelines of 2017 for public opinion. This guideline proposes to explicitly integrate landmark rulings, emerging technologies etc. The draft introduces structured examination processes, including a 7-step novelty test and 5-step inventive step assessment, to reduce subjectivity and align with global standards like the EPO. Crucially, the guidelines clarify that novel hardware is not mandatory for software patents, focusing instead on technical advancement. By providing 20 illustrative examples (10 patentable, 10 excluded) and emphasizing industrial applicability, the draft seeks to balance innovation with legal clarity, though public consultations will address challenges like defining technical effect in AI-driven inventions. These changes aim to position India as a competitive jurisdiction for cutting-edge CRI patents while ensuring alignment with judicial and global best practices.[216]

India's legal framework for software patents operates under Section 3(k) of the Patents Act, 1970, which excludes "computer programmes per se" but permits patents for innovations demonstrating a technical effect or technical contribution when integrated with hardware or solving a technical problem. To qualify, the software must enhance hardware performance, improve processing efficiency, or address a technical challenge (e.g., optimized database searches, reduced memory usage), alongside meeting criteria of novelty, inventive step, and industrial applicability. Judicial precedents, such as the Delhi High Court's 2019 ruling in *Allani* case, clarified that software-based inventions providing a "technical solution to a technical problem" are patentable, even without

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[214] BlackBerry Ltd. v. Assistant Controller of Patents & Designs, C.A. (COMM.IPD-PAT) 229/2022, 2024:DHC:6572 (Del. HC Aug. 30, 2024).
[215] Id
[216] Office of the Controller General of Patents, Designs & Trade Marks, Draft Guidelines for Examination of Computer Related Inventions (Mar. 2025), https://www.ipindia.gov.in/writereaddata/Portal/Images/pdf/Draft_CRI_Guidelines_Publication_March 2025.pdf.

novel hardware, countering earlier restrictive interpretations. However, ambiguity in defining "technical effect" and reliance on guidelines like the 2017 CRI Guidelines create drafting complexities, requiring applications to meticulously highlight technical advancements to overcome examiner skepticism. While India's standards are stricter than the U.S. (which allows "pure" software patents under certain conditions), they align with the EU's emphasis on technical character. In conclusion, securing software patents in India demands a carefully drafted application emphasizing technical innovation, leveraging judicial precedents, and navigating procedural hurdles, with evolving jurisprudence signalling recognition of software's role in technological progress-provided the technical effect threshold is met, underscoring the need for clearer guidelines and examiner training to reduce inconsistencies.[217]

3.4 CONCLUSION

India's legal framework for software protection operates through a dual mechanism of copyright and patent laws, supplemented by contract and trade secret principles, while navigating evolving challenges in data protection and compliance. Under the Copyright Act, 1957, software is classified as a "literary work", granting automatic protection to the code's expression, including source and object code, against unauthorized reproduction or distribution. However, this protection is limited to the confined to the exact expression and does not cover the functional features, algorithms, or fundamental concepts behind it.[218] The Patents Act, 1970 addresses this gap by allowing software patents under stringent conditions: the invention must demonstrate a "technical effect" or "technical advancement" when integrated with hardware, solve a technical problem, and meet criteria of novelty, inventive step, and industrial applicability.[219]

Software licensing agreements in India are governed by contract law (Indian Contract Act, 1872), copyright law, and fragmented trade secret protections under confidentiality

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[217] Dr. Urvashi Sharma, The Evolving Landscape of Software Patentability in India v. USA: Legal Barriers and Opportunities, 5 Indian J. Integrated Rsch. L. 754 (2025), https://ijirl.com/wp-content/uploads/2025/02/THE-EVOLVING-LANDSCAPE-OF-SOFTWARE-PATENTABILITY-IN-INDIA-V.-USA-LEGAL-BARRIERS-AND-OPPORTUNITIES.pdf.

[218] Jai Veer Malik & Dr. Manalal R. Pandiya, Copyright Protection of Computer Programmes in India, 7 Int'l J. Novel Rsch. & Dev. 1234 (2022), https://www.ijnrd.org/papers/IJNRD2205165.pdf.

[219] Software Patents in India: Legal Framework & Future Outlook, The Legal School (n.d.), https://thelegalschool.in/blog/software-patents-in-india (last visited May 23, 2025).

clauses. Licensing terms often include limitations of liability, usage restrictions, and breach remedies under Section 75 of the Contract Act, though standard terms remain contentious in courts. The classification of software as "goods" under the Sales of Goods Act, 1930 remains ambiguous, particularly for intangible products, creating jurisdictional complexities. Meanwhile, trade secrets rely on contractual enforcement due to the absence of dedicated legislation, leaving gaps in protection for proprietary algorithms or business processes. Income tax laws distinguish between "royalty" and "business income" for software transactions, affecting cross-border licensing and compliance.[220]

Data protection, historically governed by the IT Act, 2000, lacks a comprehensive framework, with pending legislation like the Digital Personal Data Protection Act, 2023 yet to fully address software-related privacy concerns.[221] Compliance tools such as Lawrbit, GCMS and Proind have emerged to manage regulatory risks, reflecting the growing intersection of software and legal process automation.[222]

In conclusion, India's legal framework balances innovation incentives with IP safeguards, emphasizing copyright for code expression and patents for hardware-integrated inventions. However, ambiguities in patent criteria, contractual enforcement, and data governance necessitate legislative reforms and judicial clarity. Strengthening trade secret protections, streamlining patent examination, and adopting interoperable data laws will be critical to fostering India's position as a global software leader while mitigating risks of infringement and non-compliance.

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[220] Jayakumar, Meera and Vardhan, Harsha (2008) "Software Patents in the Indian Framework: An Economic of Problems and Prospects," National Law School of India Review: Vol 20 Iss 2 Article 7
[221] DLA Piper, Data Protection Laws of the World: India, https://www.dlapiperdataprotection.com/index.html?t=law&c=IN (last visited May 23, 2025).
[222] Mamta Fasge, Overview: Legal Framework in India, Runtime HRMS Blog (Feb. 26, 2024), https://runtimehrms.com/blog/legal-framework-in-india.

CHAPTER 4

SOFTWARE PATENTABILITY IN VARIOUS JURISDICTIONS - A COMPARATIVE ANALYSIS

4.1 INTRODUCTION

The global discourse regarding software patentability is revolves around whether, and to what degree, software and computer-related inventions ought to qualify for patent protection. The debate is fuelled by differing philosophies on what constitutes innovation, the appropriate scope of intellectual property protection, and the potential impact on competition and collaboration in the software [223][224]

Software patents, as a form of intellectual property protection, play a crucial role in the contemporary innovation landscape. Unlike copyright, which covers the specific expression of the code itself, patents safeguard the underlying methods, systems, or processes implemented by software, provided they meet criteria such as novelty, inventive step, and industrial applicability. The significance of software patents is multifaceted, influencing technological progress, market dynamics, and the broader innovation ecosystem. "Information technology and related innovations shall decide the future of wealth creation for any country," underscoring the strategic importance of intellectual property (IP) frameworks that govern such innovations.[225]

Patents, as a form of IP, play a pivotal role in incentivizing innovation by granting inventors a temporary monopoly in exchange for public disclosure of their inventions. This trade-off is especially significant in the software domain, where rapid technological advances and low barriers to replication make traditional business models vulnerable to free-riding and unfair competition. The ability to secure patent protection for software-implemented inventions can thus be a decisive factor in attracting

[224] Sonisvision Blog, Should Software Be Patentable? The Debate Over Patents in the Digital World, Sonisvision(Apr.1,2024),https://www.sonisvision.in/blogs/should-software-be-patentable-the-debate-over-patents-in-the-digital-world.
[225] Rajnish Kumar Singh, Patenting Computer Related Inventions: India in Comparison with US and UK, 10(1) Delhi L. Rev. 20 (2018).

investment, fostering startups, and catalysing technological progress.[226] However, the legal landscape surrounding software patents is fraught with ambiguity and divergence, particularly in jurisdictions like India, where statutory exclusions and evolving guidelines have generated substantial uncertainty for inventors and stakeholders.[227]

4.2 SOFTWARE PATENTABILITY UNDER TRIPS

The TRIPS agreement does not have an explanatory tone regarding the patentability of software. However, it leaves a space under Article 27 that patents be available for inventions across all technological fields, if they satisfy the conditions of novelty, inventive step, and industrial applicability.[228] Article 27(1) mandates that "patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application." [229] This article does not explicitly exclude software from patentability, nor does it mention computer programs among the exceptions in paragraphs 2 and 3. [230] Some interpret Article 27 as allowing member states the discretion to decide what constitutes a patentable invention, so long as the general criteria (novelty, inventive step, industrial applicability) are met. The flexible wording of TRIPS allows WTO members significant leeway in determining the patentability of software. This has resulted in inconsistent standards and practices worldwide, even among major economies that are all TRIPS signatories[231]

TRIPS, therefore, establishes only a minimum standard (copyright protection for software) and leaves the question of patentability largely to national law and policy.[232]

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[226] Dr. Urvashi Sharma, The Evolving Landscape of Software Patentability in India v. USA: Legal Barriers and Opportunities, 5 Indian J. Integrated Rsch. L. 754 (2025).
[227] Id

[228] World Trade Organization, Module 5: Enforcement of Intellectual Property Rights, WTO Training Module Series, https://www.wto.org/english/tratop_e/trips_e/ta_docs_e/modules5_e.pdf (last visited May 23, 2025).

[229] Id
[230] Abhishek Kumar Singh & Suryakant Kashyap, Software Patentability: A Comparative Analysis, Manupatra (2020), https://www.manupatra.com/roundup/323/Articles/Software%20Patentability.pdf.
[231] S.K Verma, IP Protection of Software contracts in India: A Legal Quagmire!,Journal of Intellectual property rights, vol 17,July 2012, pp 288
[232] Id

4.3 PATENTABILITY OF SOFTWARE IN THE UNITED STATES

US has historically been one of the most liberal jurisdictions on granting patents. While enacting the Patents Act of 1952, Congressional reports of the 82nd Congress quoted that the act intended statute subject matter to 'include anything under the sun,' and this shows the inclusiveness that was intended in providing intellectual property protection.[233]

The authority to grant patents in the United States stems from Article I, Section 8, Clause 8 of the Constitution, empowering Congress "to promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."[234] This directive is operationalized through the Patent Act, codified in Title 35[235] of the United States Code.

'Section 101'[236] of the US Patent Act, 1972 outlines the types of inventions that are eligible for patent protection. According to this, "whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title."[237]

Section 102[238] The U.S. Patent Act deals with the concept of novelty, which is a key requirement for patentability. It states that an invention must be new and not previously disclosed to the public before the patent applicant's effective filing date. 'If the claimed invention was already patented, described in a printed publication, in public use, on sale, or otherwise available to the public before the filing date, it cannot be patented.'[239]

Section 103[240] addresses the conditions for patentability concerning non-obvious subject matter. It states that a patent cannot be granted for an invention if, although not identically disclosed under Section 102, the differences between the claimed invention and existing prior art would make the invention as a whole obvious to a person with

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[233] Congressional reports to the 82d congress,2d session 1952
[234] U.S. Const. art. I, § 8, cl. 8.
[235] 35 U.S.C. §§ 1–390 (2018).
[236] 35 U.S.C. § 101 (2018)
[237] Id
[238] 35 U.S.C. § 102 (2018)
[239] Id
[240] 35 U.S.C. § 103 (2018)

ordinary skill in the relevant field at the time of the effective filing date. The method by which the invention was developed does not affect its patentability.[241]

To be patent eligible in the U.S., an invention must satisfy three primary criteria under § 101, 102, and 103 of the US Patent Act i.e. The invention must fall within one of the statutory categories according to section 101[242], 'The invention must be new and not anticipated by prior art (novelty)' as per section 102[243] and the invention must not be an obvious improvement or variation to someone skilled in the art (non-obviousness) as per section 103.[244]

4.3.1 EARLY JUDICIAL ATTITUDES TOWARD SOFTWARE PATENTS in U.S.: RESTRICTION AND SKEPTICISM

The eligibility of software for patent protection has varied significantly over time, ranging from a period when software was largely excluded from patentability to a phase where nearly all software was considered eligible.[245]

The Supreme Court initially took a restrictive approach to software-related inventions. *Gottschalk v. Benson*[246], involved a patent application for a method converting binary-coded decimal (BCD) numbers into pure binary numbers by a computer algorithm. The Court ruled that the claims invalid, reasoning that the algorithm was a mathematical formula, an abstract idea not eligible for patent protection. The Court emphasized that granting such a patent would effectively grant a monopoly over a basic scientific tool, restricting its free use and impeding innovation: "Allowing a patent for such a basic scientific and mathematical formula would pre-empt the use of this approach in all fields, and would in practical effect be a patent on the algorithm itself." This decision established a restrictive baseline for software patent eligibility, categorizing pure algorithms as inherently abstract and thus excluded.[247]

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[241] Id
[242] 35 U.S.C. § 101 (2018)
[243] 35 U.S.C. § 102 (2018)
[244] 35 U.S.C. § 103 (2018)
[245] Joseph Allen Craig, Deconstructing Wonderland, Berkeley Technology Law Journal , 2017, Vol. 32, Annual Review (2017), pp. 363 https://www.jstor.org/stable/10.2307/26490248
[246] Gottschalk v. Benson, 409 U.S. 63 (1972).
[247] Id

In 'Parker v. Flook'[248] the Court rejected the patent claim for a method of updating alarm limits in catalytic chemical processes, as it primarily relied on a mathematical formula and lacked an inventive application beyond the abstract idea. Although the claim included additional post-solution steps, the Court found these insufficient to transform the abstract idea into a patentable invention. The decision reinforced the notion that the implementation of an abstract idea on a general-purpose computer or after trivial steps does not confer patentability.[249]

Gottschalk held that algorithms themselves are not patent-eligible subject matter, and in *Flook* ruled that even if an algorithm is novel and applied to an existing process, it still does not qualify for patent protection unless it includes an inventive application beyond the abstract formula.[250]

The Supreme Court's decision in *Diamond v. Diehr* [251]marked a watershed moment. The case concerned a patent application submitted by the respondents for a process that involved molding uncured synthetic rubber into precise products, utilizing a mathematical formula embedded within a computer program. Unlike traditional processes, their method allowed continuous temperature monitoring inside the mold and applied the Arrhenius equation via a computer to determine the optimal time to open the mold press. Although the process included a mathematical formula and computer-based elements, the respondents argued it improved the manufacturing process, resulting in more accurate and consistent product curing. The patent examiner and the Board of Appeals of the U.S. Patent and Trademark Office initially rejected the application, considering it non-patentable under 35 U.S.C. §101, which defines patent-eligible subject matter. However, the Court of Customs and Patent Appeals overturned this ruling, asserting that the use of a computer does not disqualify an otherwise patentable process from receiving protection. The Supreme Court affirmed this ruling,

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[248] Parker v. Flook, 437 U.S. 584 (1978).
[249] Id
[250] Joseph Allen Craig, Deconstructing Wonderland, Berkeley Technology Law Journal , 2017, Vol. 32, Annual Review (2017), pp. 363 https://www.jstor.org/stable/10.2307/26490248
[251] Diamond v. Diehr, 450 U.S. 175 (1981).

stating that the invention should be viewed as a whole. It held that the use of a mathematical formula within a physical, transformative process does not render[252][253]

The Federal Circuit's decision in *State Street Bank v. Signature Financial Group*[254] extended the *Diehr* rationale. The court held that a computerized system implementing a "hub and spoke" financial accounting structure produced a "useful, concrete and tangible result". This test effectively broadened patentable subject matter to include many software and business method inventions, as long as they produced a tangible result.[255] The State Street decision led to an unprecedented surge in software and business method patent filings. The USPTO began granting patents for internet-based commerce, financial software, and other digital inventions. The result was a landscape marked by increasing patent litigation in the software sector, Concerns over overly broad and vague patents, and Criticism from technology communities and academics about stifling innovation.[256]

In *Bilski v. Kappos*[257], the Supreme Court curtailed the expansive reach of *State Street* by invalidating a patent for a method of hedging risk. Although it rejected the Federal Circuit's "machine-or-transformation" test as the sole standard, it confirmed that abstract ideas are not patentable. The Court signalled that patent eligibility must exclude fundamental economic practices and abstract ideas, a principle applied rigorously in subsequent cases.[258]

The ruling of Supreme Court in '*Mayo Collaborative Services v. Prometheus Laboratories, Inc*'[259] ⬜ marked a turning point in U.S. patent jurisprudence by reinforcing strict limits on subject matter that is patentable under 35 U.S.C. § 101. The case concerned a method for determining drug dosage by correlating metabolite levels in the blood with therapeutic efficacy or toxicity. The Court held that the method was

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[253] Id
[254] State St. Bank & Tr. Co. v. Signature Fin. Grp., Inc., 149 F.3d 1368 (Fed. Cir. 1998).
[255] Joseph Allen Craig, Deconstructing Wonderland, Berkeley Technology Law Journal , 2017, Vol. 32, Annual Review (2017), pp. 363 https://www.jstor.org/stable/10.2307/26490248
[256] Id
[257] Bilski v. Kappos, 561 U.S. 593 (2010).
[258] Id
[259] Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. 66 (2012).

unpatentable because it merely claimed a law of nature—the correlation between metabolite levels and treatment outcomes—and added only routine, conventional steps such as administering a drug and measuring metabolite levels. These steps, according to the Court, were not sufficient to transform the natural law into a patent-eligible application. The ruling stressed that simply applying a natural law using generic instructions is not sufficient for patent eligibility; a patent must incorporate an "inventive concept" that brings a substantial and meaningful advancement to an otherwise ineligible idea. By developing a two-step framework—first identifying whether a claim is directed to a law of nature, abstract idea, or natural phenomenon, and then determining whether it adds significantly more—the *Mayo* decision provided a powerful tool for courts to screen patent claims at the eligibility stage. The Court also raised concerns about pre-emption, arguing that allowing patents on fundamental scientific principles or natural laws could stifle innovation by monopolizing tools essential for research and progress. Although *Mayo*[260]e Court's 2014 decision in Alice case. [261]

The landmark decision in '*Alice Corp. v. CLS Bank International*'[262] fundamentally reshaped the legal landscape for software patentability in the United States. The case concerned patents held by Alice Corporation on a computerized system for mitigating settlement risk in financial transactions. Specifically, the invention claimed methods and systems for using a third-party intermediary to facilitate financial exchanges to ensure that both sides of a transaction are performed as agreed. Alice's claims relied on generic computer systems to implement financial methods, prompting key questions about the patentability of such software-based inventions under 35 U.S.C. § 101. The U.S. Supreme Court unanimously ruled that the claims were not patent-eligible, as they were directed toward an abstract idea and lacked an "inventive concept" necessary to convert them into a patent-eligible invention. In doing so, the Court built upon the two-step test it had articulated in *Mayo Collaborative Services v. Prometheus Laboratories*. First, the Court found that the claims centered on an abstract idea—specifically, the concept of intermediated settlement, which is a well-known economic practice. Second,

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[261] Id
[262] Alice Corp. Pty. Ltd. v. CLS Bank Int'l, 573 U.S. 208 (2014).

it evaluated whether the individual elements of the claim, or their combination, contributed "significantly more" to convert the abstract idea into a patent-eligible application. The Court concluded that merely implementing the idea on a generic computer was insufficient to meet this standard. The Court emphasized that merely reciting generic computer components or performing conventional functions like storing, transmitting, or executing does not make an abstract idea patentable. The significance of Alice lies in its broad application to software patents and the clarity it provided on the limits of patent eligibility under § 101. The ruling invalidated a wide range of patents that merely automated well-known processes using conventional computer hardware. Importantly, Alice rejected the notion that the use of a computer alone could confer patentability on an otherwise abstract idea. This had an immediate and far-reaching effect: within months of the decision, courts invalidated numerous software and business method patents, and the U.S. Patent and Trademark Office (USPTO) began issuing more rejections under § 101 based on abstract idea [263][264]

Following *Alice*, courts focused on whether software claims demonstrated a specific technological improvement or merely described the automation of routine tasks. In decisions like '*Enfish, LLC v. Microsoft Corp'*[265]. and '*BASCOM Global Internet Services v. AT&T Mobility'*[266] The Federal Circuit upheld software patents where the invention improved computer functionality itself or offered a novel technological solution, illustrating how software could still be patentable post-Alice when crafted with technical specificity.

In essence, *Alice* did not declare all software unpatentable but set a high bar: only software that offers a concrete technological innovation beyond implementing abstract ideas on standard computers would qualify. It continues to serve as a key precedent for evaluating software and algorithm-related patent claims, shaping how inventors, attorneys, and examiners approach the drafting and assessment of such patents.[267]

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[264] Fabio E. Marino & Teri H. P. Nguyen, From Alappat to Alice: The Evolution of Software Patents, 9 HASTINGS SCI. & TECH. L.J. 1 (Winter 2017).

[265] Enfish, LLC v. Microsoft Corp., 822 F.3d 1327 (Fed. Cir. 2016).

[266] BASCOM Glob. Internet Servs., Inc. v. AT&T Mobility LLC, 827 F.3d 1341 (Fed. Cir. 2016).

[267] Daniel A. Tysver, Software Patent, BitLaw, https://www.bitlaw.com/software-patent/index.html (last visited May 23, 2025).

Software is patentable in the United States, only under the legal standard established by the Supreme Court's 2014 *Alice Corp* decision, which established a two-step test to determine whether a software-related invention is eligible for patent protection, Step One: Is the claim directed to an abstract idea? Step Two: If so, does the claim include an "inventive concept"-something significantly more than the abstract idea itself, such as a specific technical improvement or a novel way of solving a technical problem?[268]Most software patents that merely describe a general idea implemented on a computer, or that use purely functional language without a specific inventive concept, are rejected under this standard. Only software inventions that clearly demonstrate a concrete technological advancement or solve a specific technical problem in a novel way are likely to be granted patents.[269]

4.4 SOFTWARE PATENTABILITY IN EU

The story of software patents in the European Union is a tale of legal puzzles, passionate debate, and technological evolution. Software patents under the European Union's framework are governed by the European Patent Convention (EPC)[270]and shaped by decades of legal interpretation, political debates, and case law.

Article 52(1)[271] of the European Patent Convention (EPC) is the cornerstone provision defining what is patentable under European patent law. It states that "European patents shall be granted for any inventions, in all fields of technology, provided that they are new, involve an inventive step and are susceptible of industrial application" [272] Therefore the four requirements for patentability are: To qualify for patent protection, an invention must be novel, involve an inventive step that is not obvious to a person skilled in the relevant field, and be capable of industrial application.[273] The phrase "in

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[268] Id

[269] Id

[270] Convention on the Grant of European Patents (European Patent Convention), Oct. 5, 1973, 1065 U.N.T.S. 199 [hereinafter EPC].

[271] Convention on the Grant of European Patents (European Patent Convention), art. 52, Oct. 5, 1973, 1065 U.N.T.S. 199.

[272] Id

[273] Legal & Tech, Provisions of the EPC, Legal & Tech, https://legaland.tech/computer-implemented-inventions-epo/provisions-of-the-epc/ (last visited May 8, 2025).

all fields of technology" was added to align with the TRIPS Agreement and to clarify that patent protection is reserved for technical creations.[274]

Article 52(2)[275] of the European Patent Convention (EPC) specifies categories of subject matter that are not regarded as inventions within the meaning of Article 52(1). The text of Article 52(2) EPC states: "The following in particular shall not be regarded as inventions within the meaning of paragraph 1:

(a) discoveries, scientific theories and mathematical methods;

(b) aesthetic creations;

(c) schemes, rules and methods for performing mental acts, playing games or doing business, and programs for computers;

(d) presentations of information."[276]

Article 52(2)(c) EPC explicitly excluded "programs for computers" from patentability as such.[277]

Article 52(3) of the European Patent Convention (EPC) states: "The provisions of paragraph 2 shall exclude patentability of the subject-matter or activities referred to in that provision only to the extent to which a European patent application or European patent relates to such subject-matter or activities as such."[278]

The exclusions listed in Article 52(2) EPC (such as computer programs, business methods, mathematical methods, etc.) apply only when the subject matter is claimed "as such".[279] If the claimed invention, even if it involves excluded subject matter, possesses a technical character or solves a technical problem using technical means, it is not excluded from patentability under Article 52(2) and (3). The European Patent

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[274] Winter, Brandl – Partnerschaft mbB, Computer-Implemented Inventions at the European Patent Office, Winter, Brandl, https://wbetal.de/en/computer-implemented-inventions-at-the-european-patent-office/ (last visited May 8, 2025).

[275] Convention on the Grant of European Patents (European Patent Convention), art. 52, Oct. 5, 1973, 1065 U.N.T.S. 199.

[276] Id

[277] Id

[278] Convention on the Grant of European Patents (European Patent Convention), art. 52, Oct. 5, 1973, 1065 U.N.T.S. 199.

[279] Winter, Brandl – Partnerschaft mbB, Computer-Implemented Inventions at the European Patent Office, Winter, Brandl, https://wbetal.de/en/computer-implemented-inventions-at-the-european-patent-office/ (last visited May 8, 2025).

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Office (EPO) and its Boards of Appeal have clarified that the presence of any technical feature in a claim can be enough to overcome the "as such" exclusion, shifting the focus to whether the invention meets the other requirements of patentability (novelty, inventive step, industrial applicability). This means that, for example, a computer program that brings about a further technical effect (such as controlling a machine or improving computer performance) may be patentable, while a program that is merely an abstract algorithm or a business method remains excluded.[280]

VICOM (T 208/84, 1986)

The VICOM[281] case involved an invention concerning a method and apparatus for digitally processing images, specifically a mathematical algorithm for improving image clarity. The European Patent Office (EPO) initially refused the patent application, contending that it constituted a mathematical method and was therefore excluded from patentability under Article 52(2)(a) and (c) of the European Patent Convention (EPC). The applicant argued that the invention was not just a mathematical method, but a technical process that produced a tangible result-an enhanced image. The Board of Appeal decided in favor of the applicant, ruling that a method performed on a physical entity—such as an image stored as an electrical signal—and producing a technical effect, like an enhanced image, is not excluded from patentability. This decision established the principle that software-related inventions are patentable if they provide a technical contribution or solve a technical problem. VICOM is often cited as the foundation for the "technical effect" requirement in European software patent law.[282]

IBM (T 1173/97, 1998 & T 935/97, 1999)

The IBM [283]cases dealt with patent applications for computer program products. The EPO had to decide whether a computer program on its own (for example, on a disk or as a downloadable file) could be patented, or whether only the method carried out by

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[280] European Patent Office, Guidelines for Examination in the European Patent Office, Part B, Chapter VIII, Section 2.2, https://www.epo.org/en/legal/guidelines-epc/2025/b_viii_2_2.html (last visited May 8, 2025).

[281] Decision T 208/84, Vicom/Computer-related invention, 1987 O.J. E.P.O. 14 (Technical Bd. App. 1986).

[282] Decision T 208/84, Vicom/Computer-related invention, 1987 O.J. E.P.O. 14 (Technical Bd. App. 1986).

[283] Decision T 1173/97, IBM/Computer Program Product I, 1999 O.J. E.P.O. 609 (Technical Bd. App. 1998). Decision T 935/97, IBM/Computer Program Product II, 2001 O.J. E.P.O. 441 (Technical Bd. App. 1999).

the program was eligible. IBM contended that their software, when executed on a computer, generated a technical effect that went beyond the standard physical interactions between software and hardware. The EPO Board of Appeal clarified that a computer program is not excluded from patentability if, during its execution, it produces an additional technical effect—something exceeding the ordinary functioning of the computer. This "further technical effect" test became a cornerstone for assessing software inventions. The IBM decisions opened the door for patenting computer program products, provided they solve a technical problem in a novel and inventive [284][285]

COMVIK (T 641/00, 2002)

The COMVIK[286] case involved an invention related to a mobile telephone system that combined technical features (such as network communication) with non-technical features (like business methods or administrative steps). The EPO needed to decide how to assess inventive step when an invention included both technical and non-technical aspects. The Board of Appeal ruled that only the technical features of an invention are considered when assessing inventive step. Non-technical features, such as business methods or administrative rules, are ignored unless they contribute to the technical solution of a problem. This case reinforced the requirement that the inventive step must reside in the technical aspects, further narrowing the scope for patenting software that merely automates non-technical processes.[287]

HITACHI/AUCTION METHOD (T 258/03, 2004)

This case concerned a patent application for a method of conducting an electronic auction using computers and networks. The core of the invention was a business method, but it was implemented via technical means (computers and the internet). The EPO had to determine whether the use of technical means alone was enough to make the invention patentable. The Board of Appeal decided that simply implementing a non-

[285] Reinier BAKELS, The patentability of computer programmes Discussion of European-level legislation in the field of patents for Software,2002, https://ppl-ai-file-upload.s3.amazonaws.com/web/direct-files/attachments/33359941/a6397656-b852-4b53-99aa-0cc6eb4f3ca1/SoftwarePatent.pub.pdf (last visited May 9, 2025).
[286] Decision T 641/00, Two Identities/COMVIK, 2003 O.J. E.P.O. 352 (Technical Bd. App. 2002).
[287] Id

technical method (like a business process) on a computer does not make it patentable. The invention must solve a technical problem in a technical way, not just use technology as a tool. This decision clarified that the automation of business methods using standard computer technology does not meet the threshold for patentability in Europe, emphasizing the need for a genuine technical contribution.[288]

Only software that delivers a technical contribution or addresses a technical problem qualifies for patent protection. Applicants must clearly describe the technical problem solved and the technical means used.[289]

4.5 SOFTWARE PATENTABILITY IN THE UNITED KINGDOM

The Patents Act 1977 [290]is the law governing patent system in the United Kingdom. Section 1(2)[291]of the UK. Patents Act, 1977 states what are not inventions. According to this principle, schemes, rules, or methods for carrying out mental acts, playing games, conducting business, or computer programs are not eligible for patent protection.[292] However, these exclusions apply only insofar as a patent or application pertains to these items "as such." This implies that if an invention goes beyond merely being one of these excluded categories—such as by producing a technical effect or addressing a technical problem—it may still be eligible for patent protection.[293] For software to be patentable in the UK (and Europe), it must demonstrate a technical effect or solve a technical problem. Pure business methods, economic ideas, or abstract algorithms are not patentable.[294]

Aerotel Ltd v Telco Holdings Ltd & Ors[295] is a landmark decision by the Court of Appeal of England and Wales, delivered on 27 October 2006. The case is pivotal in UK patent law, particularly regarding the assessment of patentable subject matter under section 1(2) of the Patents Act 1977. Aerotel held a patent for a telephone system that allowed prepayment for calls through a specialized exchange, while Telco Holdings

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[288] Decision T 258/03, Auction Method/HITACHI, 2004 E.P.O.R. 47 (Technical Bd. App. 2004).
[289] Supra n.276
[290] Patents Act 1977, c. 37 (UK).
[291] Patents Act 1977, c. 37, § 1(2) (UK), https://www.legislation.gov.uk/ukpga/1977/37/section/1 (last visited May 9, 2025).
[292] Id
[293] Id
[294] Veer, Surbhi. (2015). Patent law in the US and the UK. Court Uncourt, 2(4), 15-16.
[295] Aerotel Ltd. v. Telco Holdings Ltd. & Others, [2006] EWCA (Civ) 1371, [2007] 1 All E.R. 225 (Eng.).

was alleged to have infringed this patent. In response, Telco asserted a counterclaim, arguing that the patent was invalid because it concerned a business method, which is excluded from patentability under UK law. The case was consolidated with Mccrossan's Application, which concerned a patent application for automating company formation using computer software. The central issue in the case was whether the inventions under consideration qualified as patentable subject matter or were excluded under section 1(2) of the Patents Act 1977, which outlines exclusions such as business methods and computer programs. The Court of Appeal, under the guidance of Lord Justice Jacob, devised a structured four-step framework for evaluating whether an invention falls within these exclusions. First, the claims must be properly construed to accurately determine what the invention seeks to protect. Second, the actual contribution made by the invention to the relevant field must be identified. Third, it must be assessed whether this contribution lies entirely within the categories excluded from patentability, such as mere business methods or software. Finally, even if the contribution appears to fall within an excluded category, it should be examined whether it possesses a technical character; if so, the invention may still be considered patentable despite its categorization. This test is now central to how the UK Intellectual Property Office and courts assess patentable subject matter. Aerotel's patent was found, in principle, to be patentable because it involved a new physical combination of hardware, not just a business method. Macrossan's application was rejected as it was considered a business method and a computer program, both excluded from [296][297]

The UK approach to software patentability was clarified in the Court of Appeal case- '*Symbian v. Comptroller General*' [298] , in which Symbian Ltd filed a UK patent application for a method that improved the functioning of computers by enhancing the way dynamic link libraries (DLLs) were managed, making computers faster and more reliable. The UK-IPO rejected the application, considering it a computer program "as such" and thus excluded from patentability under section 1(2). Symbian appealed,

[297] CMS Law-Now, Application of the Aerotel/Macrossan Test by the High Court, CMS Law-Now (Mar. 14, 2007), https://cms-lawnow.com/en/ealerts/2007/03/application-of-the-aerotel-macrossan-test-by-the-high-court (last visited May 9, 2025).
[298] Symbian Ltd. v. Comptroller General of Patents, [2008] EWCA Civ 1592

arguing that the invention provided a technical effect and was not merely a computer program. The Court held that Symbian's invention was not excluded from patentability because it made a technical contribution: it improved the speed and reliability of computers, not just the software itself. The court emphasized that the exclusion of computer programs only applies if the invention relates to a program "as such." If the program produces a technical effect-such as improving the operation of a computer-it may be patentable. The court aligned its reasoning with the European Patent Office (EPO), focusing on whether the invention provides a "technical contribution" to the state of the art. The decision clarified that software inventions are not automatically excluded from patentability in the UK. If the software brings about a technical effect or solves a technical problem, it can be patentable. The case brought UK practice closer to the EPO's approach, reducing the divergence between UK and European standards for software patentability. The judgment reinforced the importance of the "technical contribution" test, as set out in previous cases like Aerotel/Macrossan, but interpreted it in a way that is more favourable to software patents.[299]

Therefore, software is more likely to be considered patentable in the UK if it Controls or interacts with physical devices (e.g., embedded systems), Improves the internal functioning of a computer (e.g., operating system enhancements), Provides a technical solution to a technical problem.[300]

4.6 SOFTWARE PATENTABILITY IN INDIA

The Indian Patent Act,1970[301] governs the patent regime in India. 'Section 2(1)(j)' [302]defines an "invention" as "a new product or process involving an inventive step and capable of industrial application". [303] Section 3(k) [304] act states: "What are not inventions: A mathematical or business method or a computer program per se or algorithms."[305] Initially, Indian law provided only copyright protection for software,

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[299] Dechert LLP, UK Court Allows a Software Patent, Bringing UK Closer to the European Position, Dechert OnPoint (Nov. 2008),
[300] Carpmaels & Ransford, Software and Business Method Patents in Europe and the UK, Carpmaels & Ransford (Apr. 1, 2015), https://www.carpmaels.com/software-and-business-method-patents-in-europe-and-the-uk-2/.
[301] THE PATENTS ACT, 1970 (39 of 1970)
[302] The Patents Act, No. 39 of 1970, § 2(1)(j), India Code (1970).
[303] Id
[304] The Patents (Amendment) Act, No. 15 of 2005, § 3(k), India Code (2005).
[305] Id

covering the expression of code but not the underlying idea or function. The Patents (Amendment) Act, 2002 explicitly excluded "computer programme per se" from patentability, but the phrase "per se" was added to clarify that inventions involving software could still be considered if they had a technical application or effect.[306]

The introduction of Computer Related Inventions (CRI) Guidelines in India aimed to provide a clarity to the ambiguity surrounding the patentability of software. It serves as the principal reference for the examination of patent applications involving computer-based innovations. Their purpose is to ensure a consistent, transparent, and legally sound approach to evaluating the patentability of inventions that use computers, computer networks, or other programmable apparatus. The Early draft Guidelines in 2013[307] attempted to clarify the examination of software-related inventions and the guideline was intended to gain uniformity while dealing with the patent applications. In 2016, Guidelines for Examination of Computer Related Inventions were introduced. A novel hardware requirement was emphasized by 2016 guidelines. The updated guidelines reiterated the exclusion of software from patentability and introduced a new three-step test to evaluate the eligibility of Computer-Related Inventions (CRIs), thereby reinforcing a more rigorous approach towards granting patents for software-based innovations.[308] The notable point framework was the mandatory requirement for the inclusion of novel hardware in the patent claims. This meant that mere computer programs, algorithms, or software per se could not be patented unless they were integrally tied to a novel and inventive hardware component. This move was aimed at aligning with the exclusions under Section 3(k) of the act, which bars the patenting of "a mathematical or business method or a computer program per se or algorithms".[309]

[306] Zatapult, Software Patents – A Comprehensive Guide, https://www.zatapult.com/software-patents-india/ (last visited May 23, 2025).

[307] Office of the Controller General of Patents, Designs & TradeMarks, Draft Guidelines for Examination of Computer Related Inventions (CRIs) (2013) (India)

[308] Noto La Diega G (2016) Patents on Computer-Related Inventions in India. Intel Prop Rights. S1: 009. doi: 10.4172/2375-4516.S1-009

[309] Guidelines for Examination of Computer Related Inventions 2016, No. 5, https://ipindia.gov.in/writereaddata/Portal/IPOGuidelinesManuals/1_83_1_Guidelines-for-Examination-of-CRIs-19-2-2016.pdf.

Facebook during the period of 2016 CRI guidelines acquired a patent "for a method of providing access to user profile data maintained by Facebook to third-party applications" where the invention included hardware limitation.[310]

Later, Revised CRI Guidelines 2017 [311] was introduced that replaced the 2016 guidelines which are short and precise and have relaxed the criteria for patentability of the CRIs. The three-step test that was formulated under the 2016 guidelines is removed from the 2017 guidelines.[312] The change in the guidelines have created an inconsistency in the software patents.

The *'Ferid Allani v. Union of India'*[313] case is a decision which significantly shaped the approach to software patentability in India. The dispute arose when Ferid Allani, a Tunisian inventor, filed a patent application in 2002 for a "method and device for accessing information sources and services on the web." IPO rejected the application, stating Section 3(k) of the Patents Act, 1970, which excludes "a mathematical or business method or a computer programme per se or algorithms" from being patentable. The rejection was upheld by the Intellectual Property Appellate Board (IPAB), which found that the invention did not demonstrate any technical effect or advancement beyond a computer program. Allani challenged this decision before the Delhi High Court. The Court, in its 2019 judgment, undertook a detailed analysis of Section 3(k) and emphasized the importance of the phrase "per se." The Court clarified that the legislative intent behind including "per se" was to ensure that genuine inventions involving computer programs are not denied patents merely because they are implemented in software. The court emphasized that the evaluation should be based on the essence of the invention—specifically, whether it delivers a "technical effect" or makes a "technical contribution"—rather than simply considering its format or the fact that it involves a computer program. The Court provided guidance for examiners, instructing them to look beyond the presence of a computer program and to assess

[310] Anwesha Mitra, Facebook Gets Patent for Tech to Provide User Profile Data to Third Party, Fin. Express (June 28, 2017), https://www.financialexpress.com/life/technology-facebook-gets-patent-for-tech-to-provide-user-profile-data-to-third-party-644020/.
[311] Guidelines for Examination of Computer Related Inventions 2017, https://ipindia.gov.in/writereaddata/Portal/IPOGuidelinesManuals/1_86_1_Revised__Guidelines_for_Examination_of_Computer-related_Inventions_CRI__.pdf
[312] Id
[313] Ferid Allani vs Union Of India & Ors on 27 February, 2019, https://indiankanoon.org/doc/52000152/

whether the invention solves a technical problem or brings about a technical advancement. Examples of technical effects cited by the Court included improved speed, reduced hard disk access time, more efficient database search strategies, and enhanced user interfaces. The Court did not decide on the patentability of Allani's invention itself but sent back the case to the Patent Office for re-examination considering these principles and the latest guidelines for Computer Related Inventions (CRIs). After nearly two decades of legal and administrative proceedings, the Intellectual Property Appellate Board (IPAB) issued an order on July 20, 2020, granting a patent to Ferid Allani for his invention relating to a "method and device for accessing information sources and services of the web."[314]

The Ferid Allani case highlights the persistent ambiguity in the Indian legal framework concerning the patentability of software inventions. With the surge in global software innovations, identifying prior art has become increasingly complex, often involving significant time and financial costs. A major concern in this case was the lack of clarity in the court's order that directed re-examination of the application without specifying the exact grounds for doing so. Although the court referred to the need for evaluation in light of the prevailing Guidelines on Computer-Related Inventions (CRIs) and other legislative materials, it did not clarify what specific aspects required reassessment or why the earlier rejection by the IPAB, which was based on the absence of "technical effect" or "technical advancement," was insufficient. This omission raised significant concerns regarding whether such re-examinations could set a precedent for previously rejected applications to be reconsidered under new guidelines. However, the court failed to provide guidance on this point, leaving it to be determined on a case-by-case basis. This approach further complicates the adjudication of software patent applications in India. The situation is exacerbated by the lack of consistency in the CRI Guidelines themselves. The 2015 Guidelines were relatively liberal, including computer programs, business methods, and mathematical models within patent-eligible subject matter. In stark contrast, the 2016 Guidelines introduced a restrictive three-step test that required the invention to involve novel hardware and excluded business and

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[314] Pravin Anand, Shrawan Chopra & Vibhav Mithal, The Ferid Allani patent application: the Intellectual Property Appellate Board grants a patent to a computer related invention in India and provides guidance for the application of section 3(k) of the Patents Act 1970 in the future, C.T.L.R. 2020, 26(8), 219–221.

mathematical methods altogether. The Revised Guidelines of 2017 marked another shift by removing the novel hardware requirement, thereby reflecting yet another change in approach. Such frequent changes in regulatory standards and lack of clear judicial direction, as seen in Ferid Allani, have created an unstable and unpredictable environment for assessing the patentability of software inventions. The court's failure to address these fundamental issues with specificity has led to further confusion and uncertainty for applicants and examiners alike, underscoring the urgent need for a more consistent and transparent framework to govern software patents in India. [315]

'Telefonaktiebolaget LM Ericsson (Publ) v. Lava International Ltd'[316] is a landmark decision by the Delhi High Court, pronounced on March 28, 2024, concluding a decade-long dispute over the infringement of Ericsson's Standard Essential Patents (SEPs) by Lava. Ericsson's patents covered essential technologies for 2G, EDGE, and 3G standards used in mobile devices. Ericsson sued Lava for infringing eight of its SEPs, claiming Lava manufactured and sold devices implementing these standards without obtaining a license on FRAND (Fair, Reasonable, and Non-Discriminatory) terms. Lava counterclaimed, arguing that Ericsson's patents were not valid as they related to algorithms or computer programs and thus were barred from getting patent under Section 3(k) of the Patents Act, 1970. The court also examined issues of FRAND licensing, royalty calculation, and the essentiality of the patents. The court rejected Lava's argument that the patents were "nothing but algorithms" and hence not patentable under Section 3(k). The ruling clarified that Section 3(k) does not preclude patentability when algorithms are utilized in conjunction with hardware to achieve a technical outcome.[317]The court emphasized that Ericsson's inventions were not mere computer programs or algorithms, but methods and systems that enhanced the functionality of hardware components and addressed technical problems in digital communication systems.[318]

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[315] Isha Ray, The Reality of Software Patenting in India in Context of the Ferid Allani Order, 3 Int'l J. Legal Sci. & Innovation 450 (2021), https://www.ijlsi.com/wp-content/uploads/The-Reality-of-Software-Patenting-in-India-in-Context-of-the-Ferid-Allani-Order.pdf.

[316] Telefonaktiebolaget LM Ericsson (Publ) v. Lava Int'l Ltd., CS(OS) No. 764/2015, Delhi High Court (India).

[317] Id

[318] Intellepedia, A Deep Dive into Section 3(k) Analysis of Ericsson's Eight Patents – Ericsson vs. Lava – Part VII, BananaIP (May 8, 2024), https://www.bananaip.com/intellepedia/section-3k-analysis-of-ericssons-eight-patents-ericsson-vs-lava-part-vii/.

The Draft Computer Related Inventions (CRI) Guidelines 2025 was notified to represent India's latest effort to clarify patentability standards for software and emerging technologies, addressing long-standing ambiguities in Section 3(k) of the Patents Act. The 2025 draft guidelines directly incorporate key judicial interpretations, especially those requiring a demonstration of "technical effect" or "technical contribution" for patentability under Section 3(k) of the Patents Act, 1970. Technical effect is defined as improvements in hardware efficiency, performance, security, or functionality.[319] The guidelines begin by defining critical terms such as algorithm, computer program, firmware, hardware, software, and per se. These definitions serve as the foundation for interpreting and examining CRI applications.[320] Cases such as *Ferid Allani, Microsoft Technology Licensing LLC v. Assistant Controller of Patents*, and others are cited to clarify the application of law and ensure consistency in examination. The guidelines explicitly recognize AI, ML, blockchain, quantum computing, and cybersecurity as fields where computer-related inventions can be patentable, provided the invention demonstrates a technical effect. A three-step test is introduced for examiners to identify the invention's contribution (software vs. technical solution), Assess technical effect/advancement, verify industrial applicability. A new seven-step approach, inspired by the Delhi High Court's *Ericsson v. Lava* judgment, ensures systematic and consistent novelty determinations. The guidelines reaffirm the five-step test for inventive step, focusing on genuine technical contributions beyond routine computational methods, as established in *Biswanath Prasad Radhey Shyam v. Hindustan Metal Industries Ltd*. and subsequent cases. There should be Industrial Applicability i.e. CRIs must be demonstrably applicable in industry, not just theoretical constructs is mandated by the Guidelines.[321] The guidelines provide explicit examples of both patentable and non-patentable CRIs, offering applicants and examiners greater clarity and predictability. The guidelines include positive examples (e.g., software

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[319] Office of the Controller General of Patents, Designs & Trade Marks, Draft Guidelines for Examination of Computer Related Inventions (CRI), Intellectual Property India (Mar. 2025), https://www.ipindia.gov.in/writereaddata/Portal/Images/pdf/Draft_CRI_Guidelines_Publication_March 2025.pdf.

[320] Sowmya S. Murthy, BananaIP's Comments on Draft CRI Guidelines for AI, ML, and Blockchain Patents, Intellepedia (Apr. 30, 2025), https://www.bananaip.com/intellepedia/comments-on-draft-cri-guidelines-ai-ml-blockchain/.BananaIP

[321] Garima Sethi, Draft Computer Related Inventions (CRI) Guidelines, 2025 Published by the Indian Patent Office, Chadha & Chadha IP (Apr. 1, 2025), https://www.candcip.com/single-post/draft-computer-related-inventions-cri-guidelines-2025-published-by-the-indian-patent-office.

controlling industrial machinery, software improving hardware security) and negative examples (e.g., standalone business methods, abstract algorithms without technical application).[322]

The Draft CRI Guidelines 2025 represent a substantial step forward in the Indian patent regime for computer-related inventions. By integrating judicial precedents, clarifying definitions, and adopting a structured examination framework, the guidelines offer greater clarity, legal alignment, and support for innovation in software and emerging technologies, while maintaining strict adherence to the exclusions under Section 3(k).[323]

4.7 COMPARATIVE ANALYSIS

The extent to which software qualifies for patent protection has been a subject of considerable debate among leading legal systems worldwide. This divergence reflects not only differences in statutory language but also in judicial philosophy and policy priorities. While the United States historically adopted a liberal approach, recent jurisprudence made way for a clearer framework. The European Union and United Kingdom have developed nuanced frameworks centered on the requirement of a "technical effect," whereas India has maintained a restrictive statutory exclusion, reflecting concerns about overbroad monopolies and the interests of domestic innovation.

The United States is often regarded as one of the more lenient jurisdictions when it comes to granting patents for software-related inventions, rooted in the broad language of 35 U.S.C. § 101, which covers "any new and useful process, machine, manufacture, or composition of matter." Early judicial scepticism, as seen in *Gottschalk v. Benson* and *Parker v. Flook* , classified algorithms and mathematical formulas as abstract ideas, thus not patent-eligible. However, the Supreme Court's decision in *Diamond v. Diehr* marked a turning point that recognized software-implemented inventions could be patentable if they resulted in a transformative physical process. The Federal Circuit further liberalized the landscape in '*State Street Bank v. Signature Financial Group'*, holding that a computer-implemented invention producing a "useful, concrete, and

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322 Id
323 Id

tangible result" could be patented. This led to a surge in software and business method patents, many of which were criticized for their breadth and vagueness (Bessen & Meurer, 2008).[324]The Supreme Court responded to these concerns in *Bilski v. Kappos, Mayo Collaborative Services v. Prometheus Labs* , and most notably, *Alice Corp. v. CLS Bank International.* [325] The Alice decision established a two-step test for patent eligibility: first, determining whether the claim is directed to an abstract idea; and second, if so, whether it contains an "inventive concept" sufficient to transform the abstract idea into a patent-eligible application. This framework led to a dramatic increase in the rejection of software patent applications that merely automate conventional business practices or use generic computer implementation.[326]

However, software that demonstrably improves computer functionality or solves a specific technical problem, as in *Enfish, LLC v. Microsoft Corp.* (2016), remains patentable. The U.S. still allows software patents, the threshold for eligibility is now significantly higher, focusing on genuine technological innovation rather than abstract automation.[327]

The European Patent Convention (EPC), that governs patent law across the EU and other member states, explicitly excludes "programs for computers as such" from patentable subject matter under Article 52(2)(c). However, the European Patent Office (EPO) has developed a pragmatic approach, allowing software patents if the claimed invention makes a "technical contribution" or produces a "further technical effect" beyond the normal interactions between software and hardware.

Seminal decisions such as Vicom/Computer-related invention (T 208/84) and IBM/Computer program product (T 1173/97) clarified that software is patentable in Europe if it contributes to the technical character of the invention-such as controlling a technical process or improving computer performance. The EPO's Guidelines for Examination (2023) require that the claimed invention, when considered as a whole, must solve a technical problem in a novel and non-obvious way. Pure business methods or abstract algorithms, even if implemented on a computer, remain unpatentable. This

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[324] Bessen, J., & Meurer, M., "Patent Failure," Harvard University Press, 2008

[325] Lemley, Mark A., "Software Patents and the Return of Functional Claiming," Wisconsin Law Review, 2015

[326]Id

[327] Id

"technical effect" requirement is narrower than the U.S. standard, resulting in fewer software patents being granted. However, the EPO's approach is considered more predictable and consistent, as it focuses on the substance of the invention rather than the form of the claims.[328]

The United Kingdom, as a signatory to the EPC, mirrors the European approach but has developed its own nuanced jurisprudence. Section 1(2) of the UK Patents Act 1977 excludes "a program for a computer... as such" from patentability, echoing Article 52 EPC. However, UK courts have articulated a distinctive four-step test, most notably in *Aerotel Ltd v Telco Holdings Ltd*[329] and *Symbian Ltd v Comptroller General of Patents* [330]. The Aerotel/Macrossan test involves:" (1) properly construing the claim; (2) identifying the actual contribution; (3) determining whether it falls solely within excluded subject matter; and (4) checking whether the contribution is technical in nature". The UK Intellectual Property Office (UKIPO) and courts have consistently held that software is not patentable if it merely automates a business or administrative process but may be patentable if it solves a technical problem in a novel way, such as improving the internal functioning of a computer. The UK's approach is thus closely aligned with the EPO, but with a greater emphasis on the nature of the "contribution" made by the invention. Notably, the UK courts have occasionally been more restrictive than the EPO, rejecting claims that the EPO might allow . This reflects a policy preference for clarity and certainty, aiming to prevent the patent system from being flooded with trivial software inventions.[331]

India's approach to software patentability is the most ambiguous among the jurisdictions considered. Section 3(k) of the Indian Patents Act, 1970, explicitly excludes "a mathematical or business method or a computer program per se or algorithms" from patentable subject matter. This exclusion reflects a policy concern

[328] Cornish, W., Llewelyn, D., & Aplin, T., "Intellectual Property: Patents, Copyright, Trade Marks and Allied Rights," 9th ed., Sweet & Maxwell, 2019
[329] Aerotel Ltd v Telco Holdings Ltd [2006] EWCA Civ 1371
[330] Symbian Ltd v Comptroller General of Patents [2008] EWCA Civ 1066
[331] Jacob, R., "Patents and Software: A Judicial Perspective," Fordham Intell. Prop. Media & Ent. L.J., 2010

about the dangers of evergreening and the monopolization of abstract ideas, which could stifle domestic innovation and limit access to technology.[332]

The 2016 Guidelines for Examination of CRIs by IPO clarified that software can only be patented if it is claimed in conjunction with novel hardware or demonstrates a "technical effect" that goes beyond the normal interaction between software and hardware. Later the guidelines were replaced in 2017 which showed a more liberal approach. The continuous changes in the guidelines made some confusions among the innovators. The decision of Delhi High Court in *Ferid Allani v. Union of India,* marked a significant development, recognizing that software with a technical contribution may be patentable, but reaffirmed the need for a clear technical effect. The Court did not decide on the patentability of Allani's invention itself but remanded the case to the Patent Office for re-examination considering these principles and the latest guidelines for Computer Related Inventions (CRIs[333]

This decision marked a significant development that recognised technical contribution, still the ambiguities aren't cleared in the patentability of software.[334]

4.8 CONCLUSION

The comparative analysis of software patentability across the United States, European Union, United Kingdom, and India demonstrates that there is no uniform global standard. A comparative analysis reveals both convergence and divergence in the treatment of software patents. The United States, after a period of liberal grant, has moved toward a more restrictive regime, requiring a concrete technological improvement for patent eligibility. Both the European Union and the United Kingdom exclude computer programs "as such" from patentability; however, they allow patents for software that delivers a technical effect or addresses a technical issue. The UK's Aerotel/Macrossan test introduces a more structured approach to assessing the nature

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[332] Basheer, S., "India's Tryst with TRIPS: The Patents (Amendment) Act 2005," Indian J. Law & Tech, 2005

[333] Pravin Anand, Shrawan Chopra & Vibhav Mithal, The Ferid Allani patent application: the Intellectual Property Appellate Board grants a patent to a computer related invention in India and provides guidance for the application of section 3(k) of the Patents Act 1970 in the future, C.T.L.R. 2020, 26(8), 219–221.

[334] Id

of the invention's contribution, which can, at times, lead to a stricter interpretation compared to the European Patent Office.

India maintains a statutory exclusion for computer programs per se, allowing patents for software demonstrating a significant technical effect. This reflects broader policy considerations, including access to technology and the prevention of trivial or overly broad patents.

If effectively implemented, the 2025 CRI Guidelines could bring much-needed clarity and consistency to India's approach to software patentability under Section 3(k) of the Patents Act. By introducing structured tests for assessing technical effect, novelty, and inventive step, the guidelines reduce examiner subjectivity and align India's standards more closely with international practices, such as the UK and EU's technical contribution approach. They also incorporate judicial precedents like Ferid Allani and Ericsson v. Lava, strengthening the legal framework for granting software patents that solve genuine technical problems. This could encourage innovation, attract foreign investment, and support the growth of India's digital economy. However, their effectiveness will ultimately depend on consistent application by the Patent Office, examiner training, and robust enforcement mechanisms. Without proper implementation, even well-designed guidelines risk falling short of their potential.

The trend in all jurisdictions is towards requiring a clear technical contribution or effect, but the threshold for what constitutes such a contribution varies significantly.

CHAPTER 5

FINDINGS AND RECOMMENDATIONS

5.1 FINDINGS

This chapter presents the key findings that have emerged from the research on the scope of patentability of software, with a particular focus on the Indian legal framework and its comparison with the US, UK, and EU jurisdictions. Through a detailed analysis of legislation, case law, and administrative guidelines, as well as a review of relevant literature, the researcher identified significant differences, overlaps, and challenges in how software is protected as intellectual property across these regions.

5.1.1 DIVERGENT LEGAL FRAMEWORKS FOR SOFTWARE PATENTABILITY

The divergence in legal frameworks across jurisdictions are evident. In India, the statute is quite restrictive. 'Section 3(k)[335]' of the Indian Patent Act, 1970, specifically excludes "computer programmes per se" from being patented. The phrase "per se" has been a persistent source of confusion and debate. While the intention was to prevent the patenting of abstract computer programs, the lack of a clear statutory definition has led to inconsistent interpretations by the Indian Patent Office and the courts.[336]

To address these ambiguities, the Indian Patent Office issued the 2016 Guidelines for Examination of Computer Related Inventions (CRIs). These guidelines required that for software to be patentable, it must be tied to a specific hardware implementation—meaning the invention must be more than just software; it must be a technical solution involving hardware. However, the 2017 revised CRI Guidelines removed the mandatory hardware requirement, instead focusing on whether the software demonstrates a "technical effect" or "technical contribution." This shift was intended to bring Indian practice closer to international norms, but it also led to further uncertainty, as the criteria for what constitutes a sufficient technical effect remain vague and subject to examiner discretion.

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[335] The Patents Act, 1970, § 3(k) (India).
[336] Meera Jayakumar and A. Harsha Vardhan, Software Patents in the Indian Framework: An Economic Analysis of Problems and Prospects, National Law School of India Review, Vol. 20, No. 2 (2008), pp. 220-228

'The Draft Guidelines for Examination of Computer Related Inventions (CRIs)' were released by the Indian Patent Office in March 2025 for public consultation. The guidelines are meant to make it easier to understand and process CRI patent applications, keeping up with recent court decisions and the fast-changing world of technology. They are drafted to align with recent court rulings, emphasizing that CRIs must demonstrate a clear technical effect or contribution to qualify for patent protection, especially under Section 3(k) of the Patents Act. The guidelines recognize emerging fields like AI, machine learning, and blockchain as potentially patentable if they meet these criteria. They also introduce structured approaches for assessing novelty and inventive step, require detailed technical disclosures, and provide examples to guide applicants, ultimately promoting clarity and consistency in CRI patent decisions.

Indian courts have, on occasion, provided some guidance. For example, in '*Ferid Allani v. Union of India*'[337], the Delhi High Court recognized that inventions demonstrating a "technical contribution", or "technical effect" should not be excluded from patentability merely because they are computer-implemented. However, the lack of a consistent, binding precedent continues to result in uncertainty for applicants.[338]

The legal framework for software patentability adopted by the United States is governed by Section 101 of the US Patent Act, the US system permits patents for "any new and useful process, machine, manufacture, or composition of matter," which has historically included software-related inventions. [339] However, the boundaries of software patentability have been shaped primarily by judicial interpretation rather than by legislative reform. Early Supreme Court decisions such as *Gottschalk v. Benson* and *Parker v. Flook* limited the patentability of software by classifying algorithms and mathematical formulas as abstract ideas, which are not eligible for patent protection. This approach shifted with *Diamond v. Diehr*, where the Court recognized that software could be patentable if it resulted in a transformative technical effect. A major turning point occurred with the decision in Alice Corp. v. CLS Bank International, where the U.S. Supreme Court established a two-step framework: initially assessing whether the claim is centered on an abstract idea and then evaluating whether it includes an

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[337] Ferid Allani v. Union of India & Ors., W.P.(C) No. 7 of 2014, 2019 SCC OnLine Del 11867 (Delhi High Court Dec. 12, 2019).
[338] Id
[339] 35 U.S.C. § 101 (2018).

"inventive concept" sufficient to render it eligible for patent protection. This test has become the cornerstone of software patent eligibility in the US, leading to the invalidation of many patents that merely implement abstract ideas on generic computers. The USPTO has issued guidelines to help examiners apply the Alice test, emphasizing the need for software inventions to demonstrate a specific technical improvement or solve a technological problem. Despite these stricter standards, the US remains more permissive than many other jurisdictions, especially for software that enhances computer functionality or offers a technical solution. However, the lack of clear and predictable rules has resulted in ongoing uncertainty and increased litigation, with outcomes often depending on the specifics of each case and the interpretation of what constitutes an "inventive concept." Overall, the US legal framework for software patentability is characterized by its openness to software patents that meet the inventive threshold, its reliance on judicially developed standards, and its ongoing evolution in response to technological change and legal challenges. This dynamic environment continues to influence both domestic and international software innovation, making the US a key reference point in global discussions on software patent law.[340]

The legal framework for software patentability in the United Kingdom presents a nuanced approach that balances encouraging innovation with preventing the monopolization of abstract ideas. In the UK, software can be patented if it fulfills specific conditions. The key condition is that the invention must deliver a "technical contribution" or demonstrate a "technical effect" within the existing knowledge base. Essentially, the software should address a technical issue or enhance the operation of a computer or other technical system in a manner that is not obvious. The UK Intellectual Property Office (UKIPO) assesses software patents based on established guidelines derived from case law, focusing on whether the claimed invention makes a genuine technical advancement. While there is no formal statutory definition of "technical effect," successful applications typically demonstrate how the software achieves a significant technical improvement, enhances efficiency, or interacts with physical processes in a tangible way. The UK approach avoids a strict requirement for hardware integration but insists that the software offer more than just a programmatic

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[340] Dr. Urvashi Sharma, The Evolving Landscape of Software Patentability in India v. USA: Legal Barriers and Opportunities, 5 Indian J. Integrated Rsch. L. 754 (2025).

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implementation of a business method or an abstract idea. Assessing whether there is a technical contribution typically depends on the specific facts of the case and requires comparing the claimed invention to existing prior art to determine the novel technical advantages the software offers. The UK framework emphasizes the need to protect genuine innovations in software while preventing the patenting of mere applications of abstract concepts. This balance aims to foster a competitive environment that encourages further technological development without stifling incremental improvements. In general, the UK's legal approach to software patentability focuses on the software's technical contribution and its practical role in addressing real-world challenges.[341]

The legal framework for software patentability in the European Union (EU) is primarily governed by the European Patent Convention (EPC) and interpreted by the European Patent Office (EPO). In the EU, software is generally referred to as "computer-implemented inventions" (CIIs). According to Article 52(2) of the EPC, computer programs are excluded from patentability "as such." However, the EPO has developed a nuanced approach that allows software to be patented if it produces a "technical effect" or provides a "technical solution to a technical problem." This means that while pure software or abstract algorithms are not patentable, inventions that involve software and contribute to a technical field—such as improving computer performance, controlling industrial processes, or enabling new forms of communication—may be eligible for patent protection. The EPO applies a two-step test: first, it assesses whether the invention has technical character, and second, it evaluates whether the software makes a further technical contribution beyond the normal interactions between hardware and software. For instance, software that simply automates a business method or processes data without a technical effect will not be patentable, but software that enhances the functioning of a computer or interacts with physical processes in a novel way may qualify. The technical effect requirement has been clarified through EPO Board of Appeal decisions, such as T 1173/97 (IBM) and T 641/00 (Comvik), which stresses that the invention must address a technical problem in a way that is both new and not obvious. The EPO's Guidelines for Examination provide detailed criteria and

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[341] Nick Reeve & Paul Loustalan, Protecting Patents in Europe and the UK, 284 MANAGING INTELL. PROP. 67 (2019).

examples, ensuring a harmonized approach across EU member states. Unlike the US, where the focus is on an "inventive concept," or India, where software patentability is highly restricted, the EU framework is relatively clear but remains strict: only those software inventions that make a genuine technical contribution are patentable. This approach aims to strike a balance between encouraging technological innovation and preventing the monopolization of abstract ideas or business methods. [342]

5.1.2 COPYRIGHT VS. PATENT PROTECTION

Across all jurisdictions, software is inherently protected by copyright, which covers the expression of code but not its functionality. Patents, where available, protect the underlying technical innovations, offering broader protection against functional copying. The Indian regime's reliance on copyright leaves gaps for software innovations that are more functional or technical in nature, making it difficult for innovators to secure robust protection.[343]

5.1.3 IMPACT ON INNOVATION AND COMPETITION

Jurisdictions with clearer and more permissive software patenting regimes, such as the US, have seen increased innovation and investment in software development. However, these systems also face challenges such as patent thickets and litigation by non-practicing entities (patent trolls). India's restrictive approach may limit frivolous litigation but at the cost of discouraging investment and innovation in high-tech sectors.

5.1.4 INTERNATIONAL HARMONIZATION AND TRIPS COMPLIANCE

Although TRIPS mandates patent protection for inventions across all technological fields, it allows individual countries to define what constitutes an "invention" and to set their own exclusions. This has resulted in significant divergence across jurisdictions. India's current approach, though TRIPS-compliant, is out of step with major global markets, potentially impacting cross-border collaborations and foreign investment.

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[342] Christopher Heath, EU Challenges and Solutions in the Field of Patents, 1 SOC. PERSP.- J. LEGAL THEORY & PRAC. 177 (June 2014).

[343] Adhip Ray, Can You Protect Your Software by Patent or Copyright in India?, WinSavvy (n.d.), https://www.winsavvy.com/software-patent-copyright-india/ (last visited May 23, 2025).

5.2 RECOMMENDATIONS

5.2.1 CLARIFY AND MODERNIZE 'SECTION 3(K)' OF THE INDIAN PATENT ACT

Section 3(k) of the Indian Patent Act, 1970, currently excludes "a mathematical or business method or a computer programme per se or algorithms" from patentable subject matter.[344] While this provision was intended to prevent the monopolization of abstract ideas and mathematical methods, its ambiguous wording—particularly the phrase "per se"—has led to significant confusion and inconsistent interpretation by the Indian Patent Office and judiciary. This ambiguity has created a challenging environment for software innovators in India, as it is often unclear what types of software-related inventions, if any, can be patented. For patent applicants, the absence of a precise definition for "computer program per se" has led to inconsistent examination criteria and uncertain results. Sometimes, software that is closely integrated with hardware is granted a patent, while in other cases, similar inventions are rejected. For Indian developers, this contradiction makes strategic planning more difficult and deters investment in software innovation.[345] While TRIPS allows member states some discretion, it requires patent protection for inventions in all fields of technology. Modernizing Section 3(k) would ensure that India remains compliant while also fostering a more innovation-friendly environment. The clearer standards would reduce examiner discretion and unpredictability, making the process more transparent for applicants and a modernized framework would incentivize the development of original software solutions, attract foreign investment, and facilitate international collaboration.

5.2.2 ADOPT A "TECHNICAL CONTRIBUTION" STANDARD

India could consider adopting an approach similar to that of the UK and EU, where software qualifies for patent protection by delivering a technical solution to a technical

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[344] The Patents Act, 1970, § 3(k) (India).
[345] Meera Jayakumar and A. Harsha Vardhan, Software Patents in the Indian Framework: An Economic Analysis of Problems and Prospects, National Law School of India Review, Vol. 20, No. 2 (2008), pp. 220-228

problem. This would allow genuine software innovations to be protected while maintaining safeguards against abstract ideas or business methods.

5.2.3 ISSUE COMPREHENSIVE AND CONSISTENT GUIDELINES

The Indian Patent Office should develop and publish detailed, stable guidelines for examining software-related patent applications, drawing on best practices from the US, UK, and EU. Regular training for examiners and applicants would further enhance consistency and predictability. The Draft Guidelines of 2025, if implemented will change the software patent regime in India which will set a standard.

5.2.4 STRENGTHEN COPYRIGHT AND COMPLEMENTARY PROTECTIONS

While reforming the patent regime, India should also reinforce copyright protection for software, ensuring that both the expressive and functional aspects of software are adequately safeguarded. Consideration should be given to sui generis protections for software innovations that do not fit neatly into existing IP categories.

5.2.5 ENCOURAGE INTERNATIONAL COLLABORATION

India should actively participate in international dialogues on software patentability and seek to harmonize its legal framework with major trading partners. This will facilitate cross-border innovation, attract foreign investment, and ensure Indian developers are not disadvantaged in global markets.

5.2.6 PROMOTE AWARENESS AND CAPACITY BUILDING

Conduct outreach and training programs for software developers, legal professionals, and patent examiners to raise awareness of the evolving legal landscape and best practices in software IP protection.

5.3 CONCLUSION

The question of software patentability stands at the intersection of law, technology, and policy, profoundly influencing the pace and direction of innovation in the digital age. This dissertation set out to examine the ambiguities and challenges within India's legal framework for software patents, contrasting it with the more developed and nuanced

approaches of the US, UK, and EU. Through this comparative lens, several key insights and lessons have emerged.

First, India's restrictive stance under Section 3(k) of the Patent Act, 1970, has led to significant uncertainty and inconsistency. The ambiguous language—particularly the phrase "computer programme per se"—has resulted in fluctuating administrative guidelines and unpredictable outcomes for software patent applicants. While the intention behind this exclusion was to prevent the monopolization of abstract ideas and algorithms, the lack of clear statutory or judicial guidance has inadvertently stifled genuine innovation and placed Indian software developers at a disadvantage both domestically and internationally.

By contrast, the US legal framework, though not without its own complexities, provides a more permissive and innovation-friendly environment. The Alice two-step test, as interpreted by the USPTO and the courts, requires software inventions to demonstrate an inventive concept beyond an abstract idea. Despite ongoing debates about subjectivity and unpredictability, the US regime has fostered a robust software industry, encouraging investment and technological advancement.

Similarly, the UK and EU have adopted the "technical effect" or "technical contribution" standard, allowing software to be patented if it provides a novel solution to a technical problem. This approach strikes a pragmatic balance: it prevents the patenting of mere business methods or abstract ideas while ensuring that genuine technical innovations are rewarded and protected. The clarity and predictability of these frameworks have supported a healthy climate for innovation and cross-border collaboration.

The comparative study also highlights the limitations of relying solely on copyright protection for software. While copyright safeguards the expression of code, it does not protect the underlying functionality or technical innovations, leaving gaps in protection that can hinder the growth of the software sector.

The findings of this research make it evident that India's current legal regime is in urgent need of reform. The lack of clarity and the restrictive interpretation of Section 3(k) not only deter innovation but also discourage foreign investment and limit the global competitiveness of Indian software developers. To address these challenges, this

dissertation recommends a comprehensive modernization of Section 3(k), the adoption of a "technical contribution" standard, and the issuance of detailed, stable examination guidelines aligned with international best practices. The *Ferid Allani* case clarified that software-related inventions are patentable if they demonstrate a "technical effect" or "technical contribution," and that the exclusion under Section 3(k) of the Indian Patents Act should not be applied to inventions merely because they are computer-implemented. The judgment itself called for a more consistent approach, but it did not eliminate all ambiguities or provide a clear, binding statutory definition of what constitutes a sufficient "technical effect." As a result, patent examiners and lower courts continue to struggle with applying the standard uniformly. This inconsistency can be traced from the post Ferid Allani judgements i.e. in *Microsoft Technology Licensing LLC v. The Assistant Controller of Patents and Designs*[346], *Idemia Identity and Security France v. The Controller General of Patents, Designs and Trade Marks*[347] and *Blackberry Limited v. The Assistant Controller of Patents and Designs.*[348] Therefore the adoption of a "technical contribution" standard, and the issuance of detailed, stable examination guidelines aligned with international practices is a recommendation. These reforms would provide much-needed legal certainty, incentivize innovation, and facilitate India's integration into the global knowledge economy.

In conclusion, the future of software innovation in India depends on the creation of a clear, balanced, and forward-looking legal framework. By learning from the experiences of other jurisdictions and adapting their best practices to the Indian context, policymakers can ensure that the law evolves in step with technological progress. Such reforms will not only protect the rights of creators and developers but also drive economic growth, foster competition, and position India as a leader in the global software industry. The moment has come for India to move past uncertainty and establish a legal framework that genuinely fosters and sustains innovation in the digital age.

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[346] Supra n 202

[347] Idemia Identity & Security France v. Controller Gen. of Patents, Designs & Trademarks, (T) CMA (PT) No. 198 of 2023, (T) CMP (PT) No. 21 of 2023 (Madras HC Nov. 12, 2024),

[348] Supra n 205

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