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RETHINKING COPYRIGHT LAWS IN THE AGE OF OPEN-SOURCE SOFTWARE

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ABSTRACT:

Intellectual property refers to the concept of a creation of the mind that can be protected by law. One such protection offered is in the form of a copyright, which refers to the legal right of ownership guaranteed to the creator of a particular work. In the ever-developing digital age, knowledge is no longer shielded but rather used as a tool for the development of all. Major developments in computer technology have been attributed to advancements in software. Open-source software is built on the idea of benefiting mankind. In which the holder retains ownership but grants specific permissions through the open-source license. The Indian Copyright law is an amalgamation of international conventions such as TRIPPS Agreement & Berne convention. All of which provides protection for literary work under copyright law, and computer software falls under the ambit of literary work. Although Open-Source Software doesn't align with the traditional copyright law, it nonetheless, while availing the protection it provides, diversifies its usage. This paper shall explain these concepts in detail, along with the application of law and lacunas in the same.

Keywords: Intellectual property, Copyright, Open-Source Software, Literary work, Technology & Law

INTRODUCTON

Copyright refers to the exclusive legal right, given to the original creator of a particular work for a fixed number of years, to print, publish, perform, film, or record literary, artistic, or musical material.[1] The historical development of such a concept has been credited to the profound change brought in the European society via printing, it inspired a wave of literacy but had its own drawbacks. Since at that time there was no copyright law prevalent, anybody could reprint popular works and make money; this was particularly unfair to the original authors.[2]

[1] Oxford English Dictionary, https://www.oed.com/dictionary/copyright_n?tl=true (Last Visited March. 6, 2026).
[2] JOANNA KOSTYLO, "FROM GUNPOWDER TO PRINT: THE COMMON ORIGINS OF COPYRIGHT AND PATENT", 21- 50 (Cambridge: Open Book, 2010)

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The inception of copyright law can be traced to the enactment of the Statute of Anne in 1710 in England and Scotland, which was the first legislative effort to offer protection to creative works. Although regrettably, it only focused on regulating the rights of publishers rather than safeguarding the moral and proprietary rights of authors. This was looked into and addressed later in the Copyright Act of 1814, which conferred broader rights to authors. The tide began to shift with the Berne Convention for the Protection of Literary and Artistic Works, established in 1886, which said literary work, including our modern computer software and data compilation, as well.[3]

The 21st Century is filled with inventions, discovery and technology which widens our horizons of development but also poses significant challenges in the field of law. The intersectional nature of intellectual property law and cyberspace is a happening phenomenon. This has been coming for decades now; the philosophy of open software was first discussed in the year 1997 in Eric. Raymond's speech "Cathedral and Bazaar"[4]. He vehemently believed users of a software should be treated as co-developers, they should have access to the software, be allowed to make modification, fix bugs, send documentation report etc. This way, a software develops truly analysed from every perspective.[5] Over 78% of companies presently run the part of their operations or all of it on Open-Source Technology (OSS). However, with the success of a concept, there always come concerns for the future of OSS. And the community must deal with the same by answering questions such as what OSS is, what it should be, and what should be done to protect, and even the question of if it even needs protecting?[6] This paper underscores the protection already offered via the copyright laws and how, despite being a concept that aims to be open to all still the original creators' rights remain protected and further analyses the drawbacks present and provide solutions regarding the same.

THE HISTORY OF COPYRIGHT JOURNEY OF COMPUTER SOURCE CODE

A computer is known as an electronic device that processes data and performs tasks according to a set of instructions provided, called a program. How are these instructions given? Not by the words we humans use to communicate, computers do not understand our languages. Input

[3] O'Connor, Sandra day. *"Copyright law from an American Perspective." 37 IRISH JURIST*, pp. 16–22, (2002)
[4] 3, RAYMOND, ERIC (2005). THE CATHEDRAL AND BAZZAR, (First Monday 1998)
[5] Id at
[6] Tozzi, Christopher. "*For Fun and Profit: A History of the Free and Open-Source Software Revolution*. "MIT PRESS, PP 250- 256, (2017)

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to a computer is given through machine language or machine code, made up of a series of binary digits, such as 0 or 1.[7] This was historically a tedious process as it involved punching a punch card to convey the input to the computer. This was usually only able to be done by a skilled programmer. Understanding the difficulty of the process, the computer scientists developed an alternative method of writing known as "assembler language"[8]

This language offers multiple advantages over direct machine code programming, but they still require numerous instructions to accomplish even the simplest tasks. The entire evolution is based on to ease the burden on programmers, so more and more such languages, such as BASIC, FORTRAN, COBOL, and PASCAL, were all later introduce for the same. It further allows programmers to write out concise commands in a language as close as they can to resemble the universal human language, English. This version of the program, written by the programmer, is called the source code. When this source code is translated into machine-readable form by an assembler or compiler, it becomes the object code. At present, the evolution of source code has brought it to a state where, when read by a reasonable individual with its bits and pieces of English, it's understandable. It provides a sort of description of something, amounting to a literary work.

What is literary work? Literary work is known as a "non-dramatic composition that conveys, elucidates, or explores a particular subject, theme, or idea through narrative, descriptive, or expository text. Unlike dramatic works, it relies on prose or written exposition rather than dialogue or theatrical performance to communicate its message."[9] The source code falls within this explanation of a literary work. But the same protection is not provided to an object code, and this was held by the Australian High Court in a case.[10] The journey of recognition of copyright for the same began in 1986 when the Berne convention for protection of literary and Artistic Works took place. It provided that computer software (including both object code and source code) and compilation of data be protected under the Copyright Acts. Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) Article 10 of the TRIPS requires

[7] S. Bala Muralitharan, S. Rajasekaran , "*A Parameter Estimation Model of G-CSF: Mathematical Model of Cyclical Neutropenia"* , 2 *AMERICAN JOURNAL OF COMPUTATIONAL MATHEMATICS* (2001)
[8] ARCHER, BENJAMIN ASSEMBLY LANGUAGE FOR STUDENTS,128 (CreateSpace Independent Publishing Platform 2016)
[9] US COPYRIGTH OFFICE COMPEDIUM, chrome extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.copyright.gov/comp3/chap700/chap700-draft-3-15-19.pdf
[10] Gibbs J. in Computer Edge Pty Ltd vs. Apple Computer Inc (1986) 161 CLR 171

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Computer Programs and Compilations of Data, whether they are source code or object code, to be protected as literary works as per the Berne Convention.[11] TRIPS is also a part of the World Trade Organisation (WTO) and requires all its members to follow the rules it lays down. So, following this, India has amended the Copyright Act by two amending Acts, namely Act no. 38 of 1994, which changed the word "literary work" to include - computer programmes', tables, and compilations, including computer databases[12] and Act no. 49 of 1999, which replaced the word data basis with databases. This resulted in both object code and source code being protected by copyright.

BRIEF UNDERSTANDING ON OPEN-SOURCE SOFTWARE AND ISSUES IT PRESENTS

The definition of open-source software (OSS) in simple terms is a computer software through which a copyrighted owner of a source code licenses it out to other users and permits them to modify, use, or upgrade the same.[13]It is built on the principle of collaborative effect for the development of the scientific world. As the other users are treated like co-developers, they have access to the source code of the original software. The users are often in the spirit of innovation, encouraged to submit additions to the software, code fixes for the software, bug reports, documentation, etc. After all, a more scientific brain ensures efficiency, i.e., having more co-developers increases the rate at which the software evolves.[14][15] This creates developer loyalty as developers even among the users as they feel empowered and have a sense of ownership of the end product.[16] Open-source development offers the potential to quicken innovation and create social value. This has many market advantages, as well as other advantages, only lower costs of marketing and logistical services for the promotion and undertaking of an OSS. OSS can also be used as a tool to promote a company's image, including its commercial products. The OSS development approach has helped produce reliable, high-

[11] Agreement on Trade-Related Aspects of Intellectual Property Rights, Art. 10, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299
[12] Copyright Act § 2(o), No. 14, Acts of Parliament, 1957(India).
[13] James Edward Corbly, *"The Free Software Alternative: Freeware, Open-Source Software, and Libraries"* 33, INFORMATION TECHNOLOGY AND LIBRARIES, 65-75 (2014)
[14] Robles, Gregorio "*Empirical Software Engineering Research on Free/Libre/Open-Source Software".* 2 22nd IEEE INTERNATIONAL CONFERENCE ON SOFTWARE MAINTENANCE. pp. 347–350. (2016)
[15] US Department of Défense. Open Source Software FAQ" https://dodcio.defense.gov/open-source-software-faq/ (Last visited 9th March 2026)
[16] Sharma, Srinarayan; Vijayan Sugumaran; Balaji *Rajagopalan "A framework for creating hybrid-open source software communities"* INFORMATION SYSTEMS JOURNAL , 7-22 (2002)

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quality software quickly and inexpensively.[17]

ISSUES

Open-source software (OSS), although it is a highly appreciated developmental tool, the fast pace of its development makes it riddled with multifaceted issues, such as legal, economic, and political scenarios that demand careful consideration. Legally, one of the significant ambiguities that OSS faces is regarding its regulatory status, raising sub-questions like whether it should be treated as a good or a service. What qualifies as a modification? and whether licenses operate as enforceable legal contracts or simply as permissions? These uncertainties further extend themselves to other foundational questions about ownership and the right of use, thus further complicating governance of the same. which is why till today we don't have a separate law in place for this, and we rely on the interpretation of existing laws.

We have previously outlined how, through legal evolution, the classification of software under law traditionally places it within the domain of copyright, as a form of literary work, offering protection to both source and object code. But this concept has its own flaws; this protection is not uniform; based on jurisdictions, it differs markedly. For instance, the European Court of Justice excludes software functionality, programming language, and data file formats from protection, thereby favouring an open-access approach more than protection of copyright, whereas the United States adopts an even broader stance that is more supportive of open-source licensing. All of this in comparison to members of the TRIPS Agreement, where there was an idea of a balance of support and restriction on platforms like OSS.

Adding to the complexity, if we look at the issue from the other side, then we see the OSS community expressing their concern over the rising emphasis on patent rights in OSS licenses, which many feel contradicts the core philosophy of their ideology of openness and collaboration. Technological protection measures (TPMs), globally recognised through the WIPO 1996 Treaty, also pose a challenge. These measures are often seen as nothing more than walls of digital locks and are criticized by OSS proponents for excessively restricting user freedoms. Through judicial case laws, we see the majority of the judgements as of recently, the blocks have been tackled, and major wins have been secured for the open-source community.

[17] Reynolds, Carl; Jeremy Wyatt *"Open Source, Open Standards, and Health Care Information Systems"*. JOURNAL OF MEDICAL INTERNET RESEARCH. (2011)

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OSS also possesses a few challenges in the economic sector. Its very presence challenges the traditional models by redefining the value of creation and the ownership principle. Developers of a thing, rather than owning the software itself, often gain much more value through participating in its ongoing developments, and it even raises the value of the said software itself through its scientific development. Open-source software behaves like a common property resource or a public good. It has the same principles as one such as being non-rivalrous and non-excludable, increasing in value the more and more it is used and improved by the community for the community. This dynamic leads to a network of effects where collaborative engagement enhances both functionality and innovation. Contributions to OSS are largely driven not by direct financial gain but by reputation building, peer recognition, and a sense of purpose, which collectively create a powerful ecosystem of social capital and ultimately end up generating a huge sum of revenue, as seen by the successful implication of OSS recently. But there are problems of its own, such as OSS blurs the lines between production and consumption, as contributors are often end-users who benefit directly from improvements. While the model is sustainable as a social endeavour, not as a technological endeavour, as it still requires tangible inputs such as time, technology, and funding and resources often provided by academic institutions and governments. As OSS adoption has surged, especially since the mid-2000s, hybrid models that integrate open-source components with proprietary systems have become widespread. Where there is an essence of copyright laws combined with open-source licensing. Notably, tech giants such as Dell and Microsoft have adopted OSS, with Microsoft even developing a Linux-based operating system, a stark departure from its earlier adversarial stance. Yet, such selective adoption has drawn criticism for potentially exploiting OSS without proportionate contributions to its development, raising concerns over fairness and reciprocity within the ecosystem.

We've discussed the legal and economic implications, but political, although rare and unnoticeable for an untrained high is very prevalent. From a governmental perspective, the integration of OSS into public infrastructure brings both promise and risk. While governments are drawn to OSS for its cost-effectiveness, transparency, and adaptability, they are equally wary of cybersecurity threats that could come both accidental and malicious from providing free reign to users. This duality has driven many administrations to adopt a more hands-on role in the governance and oversight of OSS projects. The United States, in particular, views OSS through the lens of national security, especially given the growing technological assertiveness of nations like China and Russia. The U.S. Department of Défense now applies rigorous

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evaluation criteria to OSS adoption, scrutinizing the software's origin, maintenance viability, component security, and potential foreign influence. Globally, nations are also contending with the implications of OSS on strategic technologies such as artificial intelligence, semiconductors, cloud computing, and operating systems. These tools are vital for digital sovereignty, but their dependence on international partnerships often introduces geopolitical complexities. This paranoia of security is turning into a full-blown digital war as China's response to its exclusion from U.S.-backed platforms and its ban on Huawei's use of Google's Android operating system in 2019 was to develop its own Harmony OS, underscoring the strategic importance of OSS autonomy. Similarly, Germany has proactively established the Sovereign Tech Fund to finance the governance and maintenance of essential OSS systems used in public infrastructure, recognizing that robust public investment is key to ensuring the reliability, security, and sustainability of open-source solutions. At this point, the issues of open source are multifaceted in nature, and as the day progresses, the issues become more relevant, and the judiciary has been stepping in to answer the same.

LEGAL PRECEDENTS THAT EVOLVED THE UNDERSTANDING OF LAW.

The questions of fair use have plagued the field of software development for ages. It is a tricky and divisive line between development and violating the copyright principle. The same has been discussed over time in the judicial landscape in many cases, and let's study the outcomes of the few to determine our conclusion on the same. Firstly, we have the battle between two technological giants, Oracle America, Inc. v. Google Inc. (2010–2021). The story begins in 2005 when Google acquired Android, Inc., with the intent to move into software development. In aims of attracting skilled programmers to accomplish the same, and for feasibility, Google wanted this to be done in the familiar language of Java and approached Sun Microsystems (later acquired by Oracle) to negotiate, but talks broke down. Google then elected to create its Android platform independently, but while doing so, Google copied about 11,500 lines of code from the Java API, that to its "source code" or "declaring code" that basically provides commands on how a programme should run. This battle, starting from 2010, has spanned over a decade, with different jury tipping the balance in different favours, and in the end, Google's action was held legally valid under the exception of fair use.[18] Firstly, we must understand what fair use is- this concept refers to an affirmative defence raised by a party when one is being

[18] Oracle America, Inc. v. Google Inc. 593 US 2021

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accused of copy right infringement. It refers to permission to use a copyrighted work without the copyright owner's permission for certain purposes, such as for criticism, comment, news reporting, teaching, scholarship, or research. So, in the name of research, development, and as a win for innovative developers, this case is set to establish a precedent. But what must be underscored is the dissenting judge's opinion regarding the same. Justice Thomas said that half the statutory law in place was ignored, and we have yet again failed to analyse the Copyright Act's definition of a copyrightable "computer program", the case must have determined the extent of copyright in such matters, which it failed to do so.

The open-source movement is gaining momentum more and more. Even Microsoft, infamously known for its strong anti-open-source stance, has begun embracing the same late 2010s onward. Projects like Visual Studio Code, .NET Core, and even parts of Windows have been open-sourced. Microsoft's transformation underscores the commercial and strategic value of open source in today's world and demonstrates how proprietary and open models can coexist under appropriate copyright and licensing frameworks, if only one adheres to the open-source licensing guidelines. Time and time again, the court has strictly upheld that it values the scientific development of our world and that open source, as a tool guaranteeing it, shall be greatly revered. The open-source licensing is part of the copyright law; the owners or the original creators might have rights over their source code, but if a certain software is marketed as open source, then it must be open to the licensing of the same to use and modify by other creators. Open-source software (OSS) obligations are not optional for these owners and must be treated with the same level of seriousness as any other proprietary software agreements.[19] Courts across various jurisdictions have consistently affirmed that OSS licenses are legally enforceable, reinforcing the fact that any breach of their terms is subject to legal consequences. [20] Notably, the €900,000 fine imposed on one of the cases serves as a strong precedent, underscoring that non-compliance with open-source license conditions can result in substantial financial penalties.[21]

But one major issue still to be discussed is the ability of a copyright holder to dedicate certain work to free public use and yet enforce an open source "copyright license" to control the future distribution and modification of that work or the extent of his right. This can be understood

[19] Jacobsen v. Katzer 535 F 2008
[20] Sebastian Steck v. AVM 2023
[21] Entr'ouvert v. Orange S.A.2024

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through the case of Robert Jacobsen vs. Matthew Katzer, and Kamind Associates, Inc. The brief facts of this case are as follows. Jacobsen, the petitioner, held the copyright to computer programming code that he made for public download from a website for free. This was further made available as an "open source" or public/artistic license. Matthew Katzer and Kamind Associates, Inc., the Appellants in this case, developed commercial software products for the model train industry and hobbyists. The accusation raised was that the Appellants copied certain materials from Jacobsen's website and incorporated them into one of their software packages without following the terms of the Artistic License. Jacobsen brought an action for copyright infringement and moved for a preliminary injunction.

It was even admitted that Jacobsen was the holder of a copyright for certain materials distributed through his website. The Appellants also admitted that certain elements of the Decoder software were copied, modified, and distributed as part of the Decoder Commander software.[22] In this particular instance, the District Court's interpretation of the conditions set forth in the Artistic License failed to acknowledge the explicit restrictions that governed a downloader's right to modify and distribute the copyrighted work.

This case is significant as, ordinarily, whenever a copyright owner grants a nonexclusive license to use their copyrighted material, they usually waive their right to sue for copyright infringement, limiting the recourse to instead availing only breach of contract. However, if the person who procured the license exceeds the scope and performs a restricted function, then the licensor retains the right to pursue a claim for copyright infringement. Thus, the decisive question here is whether the act committed by the one who possesses the license, as allegedly breached, is what we know constitutes a condition of the license granted and governed by copyright law, or merely a covenant following the guidelines. Those who license their copyrighted works under open-source terms retain the right to dictate the terms of modification and distribution. Unauthorized alterations, if substantiated, would constitute copyright infringement, akin to any other unauthorized use beyond the scope of a granted license. Fundamentally, copyright licensing is rooted in the right to exclude. The decision to require compliance with open-source conditions such as disclosure of changes and attribution in lieu of monetary compensation does not diminish their legal significance. Given the speculative nature of calculating damages, these provisions would be rendered ineffective unless they can

[22] Robert Jacobsen vs. Matthew Katzer, and Kamind Associates, Inc. (Fed. Cir. 2009)

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be enforced through injunctive relief.

As we know, a copyright holder may grant permission for certain modifications while preserving the right to prohibit others under an open-source licensing. This is, indeed, the very purpose of incorporating conditions into a license, so there is a proverbial obstacle clause that protects the rights of the copyright owner. The Artistic License, like many similar open-source agreements, mandates the inclusion of copyright notices and the COPYING file in all distributed copies. Distributing modified versions of the work without such notices or without recording the changes made falls outside the license's permitted scope. The license explicitly instructs the downloaders who do not agree to its terms to seek alternative arrangements with the copyright holder. In the case at hand, the Appellants failed to pursue any such alternative arrangement. The requirements of attribution and transparency in modifications are intended not only to inform downstream users but also to direct attention to the open-source project's development platform to a purpose of genuine economic value, enforceable under the law.

SUGGESTIONS:

The above encapsulated issues can be dealt with through regulatory and policy changes. My suggestions for the same are twofold in nature - International spectrum& Domestic spectrum.
International suggestions:

1. We need to harmonize the global copyright standards, as uncertainty is the major issue the developers face, and this would ensure uniform enforcement.
2. Adoption of a common Open-Source Licensing Framework, considering all the lacunas, that could be established by legal and technological experts and passed through an international convention requiring all signatories to abide by it.

Domestic suggestions:

1. Statutory recognition of Open-Source software, as currently India is dealing with these issues through the interpretation of the Copyright Act 1957 and the Indian Contract Act 1872. So, an amendment that contains provisions that explicitly recognise this concept would be resourceful.
2. Establishment of government support programs, public funding initiative and government collaboration with technological firms would promote this concept further.

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CONCLUSION

Initially, when the Open-Source Initiative was started, its aim was to make software available to all its users so that they could make use of it and construct something better. But now such software has become more commercial in nature. Major players like Google, Linux, etc. have been making exponential profits out of these, and a billion-dollar industry has resulted from this software. In this paper, we have seen how the laws of Copyright applied to OSSs, and have also discussed the enforceability of the copyleft license, whereby it has been concluded that by means of the law of contracts, the owner of the copyright of an OSS can claim legal remedy against infringements. The law in India does not provide a separate statutory recognition to OSSs, but adequate protections are available by means of the Copyright law and Contracts law. In jurisdictions like the USA, Germany, and Singapore, there have been great legal developments regarding OSS, which we have underscored through case laws. Open-source programs have raised a ton of unprecedented legal issues, which could be debated before the courts in the days to come. This paper provides a cumulative understanding of the development and the present scenario that open-source software finds itself in. In the upcoming times, Intellectual property is going to be the most requested legal service as we have moved from the age of invention for necessity to the age of invention for curiosity.