PROTECTION OF COMPUTER PROGRAMS UNDER COPYRIGHT LAW AND ITS RELATED CONCEPTS: SPECIAL EMPHASIS TO BRICS ASSOCIATION

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ABSTRACT

With the advent of technology, society witnesses a huge revolution in field of networking and connecting worldwide commonly termed as 'Internet'. With constant advancement in technology, it enhances the convenience of a human being, may it be any task from daily routine like setting alarms to sending a goodnight text to a friend sitting at another corner of the world. It's indeed a revolution that today every person can afford a smartphone in his hand today. New complex research is being carried on in development of 'Computer Programs' which is why all the software development industries are at boom today. A computer program is a work of scientific innovation. Their annual earning turnover count to millions, every year. Because of the amount of skill and expertise involved in development of these programs, the cost of purchasing these products is seldom unaffordable. Because of such high prices, people involve in unlawful acts for procurement like software piracy, circumvention methods which leads to hampering of moral rights of developers.

The initial intention of inventing computers and internet were to make information accessible to people around the world to encourage flow of ideas and innovations and overall growth but unfortunately, we witness entirely a different mindset of people. Recognition for one's own intellectual property (IP) right is at peak. This consciousness of their right in one's own intellectual creation gave rise to Copyright Laws. In this research paper, protection mechanisms of Computer Programs have been explained through study of intellectual property laws of countries in BRICS association with comparison to UK & USA IP laws. The paper focuses more on requirements of changes in Indian legislation by comparisons. It also discusses methods which provide proper safeguard mechanisms legally and it is important for the benefit of the developers who frequently face problems of software piracy, circumvention issues and moral rights.

INTRODUCTION

Computers programs face continuous threat and are not enough protected which make them prone in getting copied or modified by other developers and end-users. People are involved in developing of programs which help in copying of another computer program which can hack into the programing of it. There is constant threat to copyrights to those developers who apply their skill and hard work in designing software.

There are multiple legal and moral right issues which arise in today's age of technology. These are interfering with creator's rights which is a serious matter of concern. A serious issue can be anticipated, in the types of programs which are meant to make a certain task easier and convenient for the end-user. For instance, earlier the research work required to be done in courses after post-graduation say Doctoral degrees, there were tremendous handwritten work which was required to be done and then it was typed, corrected then retyped and then finally submitted.

Today, because of the Computer Programs like MS office, we can edit our work numerous times. There is no restriction as to number of times we can erase our work and start it again, it can be done as many times as one wishes to do it. MS Office as a computer program has not only improved the editing problems of consumer but also has made it time and money efficient. Today, every student and professional are using MS Office for accomplishing tasks in their jobs but how many of them buy original licensed version of MS Office? Very few. There is a serious need to ponder upon the legal rights of developers, investigate the existing laws for their safeguards and suggest amendments if they are not effective enough.

This research paper intents to cover those ignored issues relating to effective mechanisms of copyright in Computer Programs in India and check if they are sufficient or not. This will also cover the criminal offences and the punishments mentioned under the Indian Copyright Act and compare them with US Copyright Laws and Copyright Laws in BRICS (Brazil, Russia, India, China & South Africa)[1] countries, to analyze if Indian laws are sufficient or not.

All the BRICS countries are member of World Trade Organization (WTO) which will make it easier to compare with respect to common IP laws mentioned under *Agreement on Trade-*

[1]Official Website of BRICS Ministry of External Relations https://brics2021.gov.in/about-brics accessed 26 October 2022.

Related Aspects of Intellectual Property Rights, 1994 (TRIPS). The researcher intends to take BRICS countries specifically in comparison to laws with developed countries like the United States of America (USA) and United Kingdom (UK) which in result will explain the actual growth of laws.

I. CONCEPT OF COMPUTER PROGRAMS AND ITS ORIGIN

Industrial revolution in 18th & 19th century was a major even in the history of mankind which has brought consciousness in society to work together and share resources. Later, with the inventions and innovations which have proved to be major contributor to evolution, Intellectual Property Rights held a strong position with respect to ownership rights. Today, we live in an era of technology where in software developer form as a significant industry is. These programs are available to us in four ways which are Pay ware, Shareware, Freeware and Open Sources.[2] The ownership of the software programs[3] are owned by the creators or organizations for which they are working (in such cases, the person who developed the program will remain author of it forever).

There have been different definitions of Computer Programs accepted by various countries and are enacted in their laws, but the interpretations are similar in nature. Today, the most widely accepted definition is traced from the one being provided under the TRIPS under Article 10[4], *as something which is combination of source code and object code, and which is capable of being protected as literary work under Berne Convention* (1979). There is also an ongoing debate whether source and object code both come under the purview of the copyright protection. For this research paper, we will take the assumption that only source code[5] is copyrightable not the object code as it involves human inputs and skills which is the subject matter of copyright protection.[6]

A. DEFINITION OF COMPUTER PROGRAMS UNDER DIFFERENT COPYRIGHT LAWS

The European Union Community (EU) was the first to undertake initiative to develop an

[2] Mark A. Lemley, Peter S. Menell, Robert P. Merges, Pamela Samuelson & Brian w. Carver, 'Software and Internet Law', Wolters Kluwer Law & Business, (4th Ed. 2011).
[3] For further references, terms 'Computer Program' & 'Software Program' are used interchangeably with same meaning.
[4] Agreement on Trade-Related Aspects of Intellectual Property Rights, 1994, Article 10 'Computer Programs and Compilations of Data'.
[5] Commonly understood as the algorithms designed and written by any software developer.
[6] 'Copyright Protection of Computer Program Object Code', Harvard Law Review, 1723-1744 (1983).

IP protection regime for Computer Programs, in accordance with which all member nations would harmonize their laws. Initiating with a Green Paper[7], which elaborated on copyright, it encouraged to adopt the sui generis approach of protection through 'the Software Directive'. Under *UK Copyright Act, 1956*, there was no mention of Computer Programs. There came an understanding when Apple Computer Corporation sued an importer of its computer "clones"[8] in Australia and it was held that the Copyright subsisted in object code programs as that are the one which is being made by the developers through computer languages and algorithms.

In USA, the copyright and patent laws were created by Congress under its constitutionally mandated power. *The National Commission on New Technological Uses of Copyright Works* (CONTU) conducted an early expert advisory study, which recommended use of the copyright laws. In 1980, the *US Copyright Act, 1976* was amended and a definition of Computer Programs was included along CONTU recommendations.[9]The definition is very comprehensive in nature as it mentions that *a set of statements or instructions to be used directly or indirectly in a computer to get a specific result is computer program.*[10]

In Brazil, the *Law on Copyright and Neighboring Rights, 1998* was enacted and even after the latest amendment in 2013[11], there is no definition of Computer Programs in their laws. Under the *Indian Copyright Act, 1957*, a definition is being provided after 2012 amendment, under Section 2 (ffc) which includes Computer Programs in literary works.[12] The Indian Act, also allows various rights in connection with Computer Programs such as the right of reproduction, storage, making copies, adaptation, sale, rental, etc.

B. VIOLATION OF COPYRIGHT LAWS IN COMPUTER PROGRAMS

The history behind the protection of Computer Programs as an IP has countless coils after which it has been accepted that since a Program constitutes as a literary work it should be protected under copyright and not patent.[13] So after various precedents, the patent and

[7] Green Paper, BBC News UK, 15:06 GMT, Monday, 1 September 2008, http://news.bbc.co.uk/2/hi/uk_news/politics/82326.stm *, "A Green Paper is a consultation document issued by the government which contains policy proposals for debate and discussion before a final decision is taken on the best policy option"* accessed 26 October 2022.
[8] *Apple Computer, Inc. v. Computer Edge Pvt. Ltd.,* 1984 FSR 246, Austl.
[9] Vikrant Narayan Vasudeva, 'Copyright-patent dichotomy in context of Computer Programs', (2008) PL Sept 9.
[10] U.S. Copyright Act, Title 17 of the US Code, Chap. 1 § 101 'Definitions'.
[11] Law on Copyright and Neighboring Rights, as amended by Law No. 12.853 of August 14, 2013) Law No. 9.610, of February 19, 1998.
[12] The Copyright Act, 1957 (Act 14 of 1957), Section 2(o) 'Literary work'.
[13] *In re Bielski,* 545 F. 3d 943, 88 U.S.P.Q.2d 1385 (Fed. Cir. 2008).

copyright dichotomy was resolved on the ground that the entire source codes involved in the program will be entitles for copyright protection and the method adopted to reach a particular algorithm can be protected as patent, though the facility to protect under patent is only seen in USA till now.

There was another insight where it a proposal was made to protect these Programs as Trade Secrets.[14] This can be a good solution to the problems but because of lack of laws with regards to trade secrets in some jurisdictions. If there is an infringement, reaching to a solution and regulation of the protected work will become cumbersome in case of trade secrets.[15]

Under the copyright law, the copyrightability comes into question when any infringement is in doubt. As per the criterions being mentioned in Indian laws, the expression in the form of work is protectable but not the idea. This is called Idea-Expression Dichotomy. But under Indian laws none of the terms, 'idea' or 'expression' is defined. So, the solution for this idea-expression dichotomy is resolved under TRIPS which all WTO member countries have to comply with.[16] Under Art. 9(2)[17], the copyright protections to ideas have already been excluded. It is established that same principle of dichotomy will be applicable for Computer Programs also.

In *Whelan Associates v. Jaslow Dental Laboratory, Inc*.[18], the Federal court discussed the Idea/Expression dichotomy with reference to Computer Programs. It held that "*The line between idea and expression may be drawn with reference to the end sought to be achieved by the work in question. In other words, the purpose or function of a utilitarian work would be the work's idea, and everything that is not necessary to that purpose or function would be part of the expression of the idea. Where there are various means of achieving the desired purpose, then the particular means chosen is not necessary to the purpose; hence, there is expression, not idea.[19]*"

An interesting explanation of dichotomy was presented in *Baker v. Seldon*[20], where the

[14] Robert C. Scheinfeld & Gary M. Butter, 'Using Trade Secret Law to protect Computer Software', 17 Rutgers Computer & Tech. L.J, 381 (1991).
[15] Richard Raysman, 'Protection of proprietary software in the computer industry: trade secrets as an effective method', 18 (4) Jurimetrics Journal, 335–351(1978).
[16] *Apple Computer Inc. v. Franklin Computer Corp.,* 4 101 US 99.
[17] Agreement on Trade-Related Aspects of Intellectual Property Rights, 1994, Article 9.
[18] 479 US 1031 (1987).
[19] Ibid
[20] 101 US 99 (1879).

Federal Court held that "*the line between idea and expression maybe drawn with reference to the end sought to be achieved by the work in question. In other words, the purpose or function of a utilitarian work would be the works idea, and everything that is not necessary to that purpose or function would be part of the expression of the idea…where there are various means of achieving the desired purpose…the particular means is not necessary to the purpose; hence there is expression, not idea.*[21]"

In *Lotus Development Corp. v. Paperback Software International*[22], the court came up with three steps test to solve idea/expression conflict where in first step there is determination of distinction between idea/expression within the program by relying on the opinions and suggestions of counsel and jurists. In next step there is focus upon whether an alleged expression of the idea is limited to elements essential to expression of that idea or any other elements. In the final step, it is checked if there is substantial similarity or not between the copyrighted work and the alleged infringed work.

Highlighting towards the points of modifications, adaptations, reproduction of Computer Programs, the statutes are very clear in saying that the owner of the copyright have the right to do any of these with his/her work. Under Section 14(b) of *Copyright Act, 1957* of India, the person whose work subsists copyright has exclusive rights to reproduce, issue copies, perform the work in public or communicate to public, make any cinematograph film, translation, adaptation and sell or give the work as commercial rental.[23] This subsection came in 1999, which shows that the rights of developers have been quite clear in India since then.

Under USA Copyright law, similar provision can be seen, where the owner of the copyright is solely responsible for circulation of the work.[24] After the infringement is proved in the court of law, there are remedies both civil and criminal which can be put up. The offences and its type are covered under Copyright Act & The Information Technology Act, 2000.

There are laws, where the usage of Computer Programs will not count as infringement which are considered under fair dealing provisions but the standard and level till which the copying is allowed is not mentioned anywhere under the statute. US Copyright law has tried to

[21] Ibid
[22] 740 F. Supp. 37 (D Mass. 1990).
[23] The Copyright Act, 1957 (Act 14 of 1957), Section 14.
[24] U.S. Copyright Act, Title 17, Chap. 1 §109 (b) (1) (A).

solve this problem by following a 'Four Step test'.[25] Joseph Story J. is appreciated for lying down the foundation for this fair use doctrine in case of *Falsom v. March*.[26] The Four-Factor test is used for assessing whether a particular use lies in the ambit of fair use, as against an exhaustive list of activities that constitute exceptions to copyright. The four steps include:

(a) The purpose and character of the use, including whether such use is of a commercial nature or is for non-profit educational purposes

(b) The nature of the copyrighted work

(c) The amount and substantially of the portion used

(d) The effect of the use upon the potential market value of the copyrighted work.[27]

The provisions of such fair dealing are mentioned under Section 52 (1) (aa), (b) & (c) of Indian laws[28] and in Laws in USA also under title 109 (b) (1) (A), 117 and 121.[29] So we can infer that countries do recognize all the fair dealing provisions, otherwise absolute monopoly will ruin the software industries. The doctrine of 'first owner of copyright' as under section 17 of the Indian Copyright Act is not an absolute right. There lies a 'contract of service' between developer and the employer who has employed that developer.

In Indian and USA, the protection is given to any work if it has attained some form or has attained fixation and so the idea of making such a computer program is not protected. Lastly, there are moral rights which vest with every creator of the work and so it is interesting to see that how moral rights are there with the software developers.

II. ANOMALIES FACED BY SOFTWARE DEVELOPERS: SOFTWARE PIRACY

Protection of a software program for a developer or a software owner is one of the most upcoming issues. There are various problems which they faced among which lack of legal protection is the most important of all. The most affected group out of these is, founders of 'Startups'. Today, with the advent of more and more innovations taking place, which makes it

[25] Pragalbh Bharadwaj, 'A critical Appraisal of the 'Fair Dealing' doctrine under copyright law in India: Highlighting the Imperative need for reform', 2 HNLU SBJ 39 (2016).
[26] 9 F Cas 342 (C.C.D. Mass.1841).
[27] Ibid
[28] The Copyright Act, 1957 (Act 14 of 1957), Section 52 "Certain acts not to be infringement of copyright".
[29] *Supra* note 24.

important for people involved in startup culture to save themselves from being copied. Their amateur approach could easily be taken advantage.

A. MEANING & DEFINITION

The programs which are subject matter of copyright are classified under source codes which involve all the algorithms and thought process of a coder. So, in cases of infringement of source codes basically, stealing of a unique algorithm takes place which can also be termed as Software piracy. It may be defined as unauthorized use or duplication of intellectual property protected software. Such piracy can mean massive counterfeiting and revenue, or it can provide collective benefits in the form of cost savings, for instance peer to peer downloads on the Internet or small illegal efforts related to individual use. Software piracy is more serious in most other industries than piracy, as the nature of the software products enables both massive reproductions for profit and copying individuals and organizations with one click.

Software piracy is therefore a global problem for politicians, businesses, and consumers, as there are uncertainties surrounding leaking of cross-border conflicts, business losses and consumer victimization of viruses.[30] One of the most important steps to check if there is any piracy or not is that whether or not there is copyright in the work or not. Without those claiming copyright in the software programs being infringed, resorting to means as adopted by the plaintiffs and their investigators to assure themselves, before initiating legal action, of piracy/infringement, it would be virtually impossible for them to impregnate the offices and places and affairs of infringers.[31]

At global level, software protection is not as harmonized as other forms of IP protection, which further aggravates the piracy problem because countries have more diverse protection policies. Countries like the USA, Japan and some European countries protect software by both copyright and patent rights, while the rest of the world are generally faithful supporters of copyright protection of software on the grounds of quick protection, less fear of infringement, and a cheaper and simpler commercializing process with fair competition. For instance, EU does not protect software under patent laws, but does not prevent individual countries from granting software patents. This means that there is a degree of policy inconsistency between

[30] Yang, D., Sönmez, M., Bosworth, D., & Fryxell, G. 'Global Software Piracy: Searching for Further Explanations', 87 (2), Journal of Business Ethics, 269-283 (2008).
[31] *Symantec Software Solutions Pvt. Ltd. & Ors. v. R. Modi & Ors.,* 2016 SCC OnLine Del 5528.

EU members with respect to software protection. Thus, uncertainty will continue to exist, producing further confusion about protection levels and anxieties about litigation.

Along with software piracy, cases of minute modifications in the software to make it user friendly are also being seen. The right to reproduction of the work should be given only by the owner of the computer program as he holds the copyright of it but even after such protection's cases of reproduction and unauthorized copying are there. There are various reasons as to why such piracy of software happens, out of which one major reason is the cost of computer software. Most of the software which we use even in our daily life are very expensive and some of them are even out of reach of middle-class consumers. Due to this people look for copied or pirated versions of software without realizing that this might be hampering intellectual property of a developer.[32]

B. INTERNATIONAL LAWS ON PIRACY

In 1970s countries like USA and UK started to think about the protection which a computer protection should deserve so a report was submitted by International Bureau of WIPO named Model Provisions on the Protection of Computer Programs[33] which basically talked about the idea that Computer Programs should be given some amount of intellectual property protection. Since then, it has been prevalent in debates worldwide when finally in 1994 Trade Related Aspects of Intellectual Property Rights (TRIPS) were formed which mandated minimum standards to be followed by every WTO member country. This document is also a derivation of other international conventions which came prior to this.

1. *Trade-Related Aspects of Intellectual Property Rights (TRIPS), (1994)*

TRIPS is one of the first international agreements that explicitly include Computer Programs in the copyrighted works. There are three types of protection which can be taken for computer protection, which are patents, copyrights, and trade secrets. As mentioned in previous sections, Article 10 mentions copyrightability of Computer Programs.[34] Similarly, Article 27(1) recognizes patent protection for software related invention for the member states so long

[32] Robert Lynch, 'Software Piracy', 222 (4626), American Association for the Advancement of Science, 874(1983).
[33] 'Draft Treaty For The Protection of Computer Software', Committee of Experts on the Legal Protection of Computer Software, Geneva, World Intellectual Property Organization (1983).
[34] *Supra* note 4

as the invention satisfies the requirements for patentability which are country specific.[35] On the other hand, Article 39 of this Agreement provide an alternative to copyright protection.[36] It speaks of the protection of undisclosed information and gives a trade secret to the protection of software. Certain software may contain valuable and confidential information about a trade secret. Most laws provide for civil and criminal sanctions against unauthorized disclosure or use of confidential information. In this case, there is no exclusive right, but indirect protection based on an actual feature of the information which needs to be hidden from all and its business value. Unlike patents, business secrets are protected if the information remains secret.

The above provisions are only related to the protection aspect of software programs, but don't mention the procedure or remedies if any infringement happens. According to Article 61 of TRIPS, it provides criminal sanctions in cases of *'copyright piracy on commercial scale'* which does include software also.[37] This Article mentions the remedies in from of imprisonment or monetary fines sufficient to create deterrence. There can also be seizure, forfeiture, and destruction of forfeiture goods.[38]

2. *Berne Convention, (as amended in 1979)*

The only link which Computer Programs have with the convention is that of the category within which they can be protected. Bern convention covers copyrighted works, hence there is writing of codes involved in programs, which could be covered under literary works under Article 2(1). There is no mention of cases where infringement of copyright could happen like software piracy. Hence, this convention is silent about copyright piracy or software piracy or any criminal sanctions.[39]

3. *WIPO Copyright Treaty, 1996*

The significance of this treaty is very less in comparison to TRIPS as it only talks about copyrighted works. The main aim of enacting of this treaty was to recognize computer program

[35] Agreement on Trade-Related Aspects of Intellectual Property Rights, 1994, Article 27 'Patentable Subject matter'.
[36] Agreement on Trade-Related Aspects of Intellectual Property Rights, 1994, Article 39 'Protection of undisclosed information'.
[37] Agreement on Trade-Related Aspects of Intellectual Property Rights, 1994, Article 61 'Criminal Procedures'.
[38] Ibid
[39] 'Document on Bern Convention for the Protection of Literary and Artistic Works' https://www.wipo.int/edocs/lexdocs/treaties/en/berne/trt_berne_001en.pdf accessed 27 October 2022.

as a part of literary works.[40] Articles 4 & 5 are specifically dealing with protection of Computer Programs and compilation of data.[41] Under Article 7 right of rental to authors or owners of the programs are mentioned.[42] But in this treaty too, there is no mention of any criminal sanctions provided for software piracy.

4. *USA Laws on Software Piracy*

It is presumed that the IP laws in USA are very strong as they value it a lot, but the main reason of them having an upper hand is their laws. *No Electronic Theft (NET) Act, 1997* was enacted to safeguard the copyrighted content which is available in any electronic form.[43] This included the Computer Programs which are very much theft prone and might lead to software piracy. This Act provides for criminal sanctions as well.

Another law which provides punishment for cyber hacking and theft of content is *Computer Fraud & Abuse Act, 1986*. This Act is derived from U.S. Code Title 18, Section 1030 which is '*Fraud and related activity in connection with computers'*. So, software piracy can take place in a way, whereby means of fraud the work has been replicated from the owner and the terms and conditions of the license or assignment are not being followed. Section 107 provides that fair use of a copyrighted work for the purposes such as criticism, comment, news reporting or research is not an infringement.[44]

In case, *Sega Enterprises v. Accolade*[45], the issue was whether the U.S. Copyright Act permits (without the right owner's consent) the disassembly of a Copyright computer program to gain an understanding of the protected functional elements of the program. The Court held that *"when the person seeking the understanding has a legitimate reason for doing so and when no other means of access to the unprotected elements exists, such disassembly is as a matter of law a fair use of the copyrighted work"*. There are cases which panelizes 'substantial similarity' as well between two programs.

[40]WIPO Copyright Treaty, 1996 https://wipolex.wipo.int/en/text/295157 accessed 27 October 2022.
[41] WIPO Copyright Treaty, 1996 Article 4 'Computer Programs & Article 5 Compilation of Data (Databases)'.
[42] WIPO Copyright Treaty, 1996 Article 7 'Right of Rentals'.
[43]Document on No Electronic Theft Act, 1997 https://www.govinfo.gov/content/pkg/PLAW-105publ147/pdf/PLAW-105publ147.pdf accessed 27 October 2022.
[44] U.S. Copyright Act, Title 17, Chap. 1 § 107 'Limitations on exclusive rights: Fair Use'.
[45] 977 F. 2d 1510.

5. *Brazil Copyright Law (Law No. 9609/1998 on The Protection of Intellectual Property of Software, its Commercialization in the country, and other provisions)*

For protection of intellectual property of software, they have a separate legislation which is Law No. 9609/1998 and is also known as 'Software Act'. Brazil is one of the pioneering country which enacted Law and Implementing Decree on Software Protection, 1987[46] whose aim was to 'provide protection to software in Brazil and to establish rules for marketing it'.

Under Chapter V of the Act, in Section 12 penalize software programs which provide for penal sanctions for software piracy.[47] Under that, if the rights of the author of developer is hampered the punishment provided is for 6 months to 2 years of imprisonment. Also, under clause (1) of Section 12 , if reproduction has been done partially or fully of the work, in that case one to four years of imprisonment can be given. The term protection of software in Brazil is 50 years, counted from January 1st of the year following its publication or, in the absence of publication, counted from the date of its creation. Interestingly, there is fair use provisions in Software Act which is under Section 6.[48] There are exceptions mentioned under Law No. 9610/1998 also which is known as 'Copyright Act'. Copyright Act mentions that protection which is given to software programs to the literary pieces but regarding it safeguard are shifted to Software Act which is a more specialized law.

6. *Russia Copyright Law*

In Russia, Part IV of Russian Civil Code, 2008 is an important law for copyright protection. Now, under this Part of the Code comprehensive legal framework governing IP issues are added, however in many substantive respects its provisions that are applicable to copyright are similar to the provisions of its predecessor 1993 Russian copyright law.[49] Under the law, Computer Programs have been provided protection under literary. Fair dealing provisions are also mentioned under Section 25 of the Act.[50] The Act in today's scenario seems to be an old

[46] Law No. 7646 of December 18, 1987.
[47]'On the Protection of Intellectual Property of Software its Commercialization in the Country, and Other Provisions (Brazil) Law No. 9609', of February 19, 1998.
[48] (Law No. 9609/1998) Section 6 'Acts which shall not constitute offence to the rights of Software Program'.
[49] Petr Shevtsov and Valentin Petrov, 'Russian Federation: General Overview of Russian Copyright Law', Available at:http://www.mondaq.com/russianfederation/x/322826/Copyright/General+Overview+Of+Russian+Copyright+Law accessed 3 November 2022.
[50] Law of the Russian Federation No. 5351-1 of July 9, 1993 on Copyright and Neighboring Rights, Section 25 'Free Reproduction of Computer Programs and Data Bases'.

one as it doesn't mention anything about the protection mechanisms of the software programs and anti-circumvention measures.

As per *BSA Global Software Survey* done worldwide, Russia has one of the world's top five highest software piracy hubs and stands second among twenty economies where software piracy are observed.[51] The main reason behind this is the commercial rate of licensed software. Russia acts as a hub for several websites that sell, and host pirated content online. With regards to internet piracy, the *USTR 2012 Special 301 Report* noted that although Russia has made important progress in 2011, the problem of unlicensed services, websites hosting infringing material, and services that are intended to promote the infringing of copyright.[52] So, like any other developing country, they too are struggling with software piracy and trying to come up with laws which can regulate them.

7. *China Copyright law (Copyright law of the People's Republic of China, 2010)*

China has been a major contributor in bringing new technology and innovation to the world because of which they have a strong IP base in their jurisdiction. China has been accused for a lot of infringement issues as well by USA but no substantive proof have been found against it yet.[53] As per the BSA Global Software Survey report, China stands on top in offence of software license misuse and piracy hotspots in the world.[54] After COVID-19 spread, China has been accused for other IP infringements on various occasions as well. Under their copyright law, Computer Programs have been protected and have proper safeguard provisions as well.

Under Article 47 (8) and 53, punishments and enforcements have been mentioned in cases of infringement of software programs.[55] One most unique provision is Article 59, which states that for the right communication of information on network and protection of software will be separately regulated by the State Council.[56] In a way, they give priority to cases where

[51] Michael Goff, Software Piracy Statistics 2022, https://www.revenera.com/blog/software-monetization/software-piracy-stat-watch/ accessed 27 October 2022.
[52]Office of the United States Trade Representative, 2012 Special 301 Report https://ustr.gov/sites/default/files/files/Press/Reports/2018%20Special%20301.pdf accessed 3 November 2022.
[53]Grant Clark, What is Intellectual Property, and does China steal it? (21 Jan.2019 03:35 P.M.) https://www.bloomberg.com/news/Articles/2018-12-05/what-s-intellectual-property-and-does-china-steal-it-quicktake accessed 22 March 2019.
[54] *Supra* note 51
[55] Copyright Law of the People's Republic of China, Article 47 & 53, 'Chapter V Legal Liabilities and Enforcement Measures'.
[56] Copyright Law of the People's Republic of China, Article 59, 'Chapter VI Supplementary Provisions'.

infringement of Computer Programs has been there.

8. *South Africa Copyright Act, 1978 (As amended in 2015)*

The inspiration of South African Copyright law is from USA Copyright law. With regards to their consciousness of protection for Computer Programs, it came into 1992 when they made amendments in the Copyright law. Then after TRIPS came into being, they again made amendments in 1997 and made their laws as TRIPS complaint.

The Section 11B was inserted in 2012 which mentions the nature of Computer Programs and what all can an owner of do with it. The copyright law has mentioned fair use provisions under Article 19B. One unique feature is mentioned under Article 20 where moral rights of the author are being mentioned which is very much required in copyright law. Infringement of copyrighted work which is our matter of concern here is mentioned under Article 23 which highlights that software piracy is punishable just like any other infringement.[57]One can infer that South African copyright laws are quite equipped with provisions regarding protection of Computer Programs.

C. INDIAN LAWS ON SOFTWARE PIRACY

The pace at which Indian IP journey is growing, is enormous. Law making bodies are getting more sensitive about the contemporary trends of technology being followed in developed countries. Software piracy is considered theft of both intellectual property and a severe cybercrime. So, hacking of the codes made by developers is a kind of crime covered under cyber laws. Since, cyber space is relating to any information which is electronically created and is transmitted electronically, so software piracy is very much criminalized under cyber laws of any country. Following are those laws which provide protection from software piracy in India.

1. *Copyright Act, 1957*

Under this Act, a separate chapter for offences under copyright is being mentioned. The chapter starts with the provision Section 63 which stands like an umbrella provision and covers

[57] South Africa Copyright Act 98 of 1978, Chapter 2 'Infringements of Copyright and Remedies'.

all kinds of infringements subsisting in copyrighted works.[58] This provision can be explained in terms of the online service providers which are like search engine. With regards to the use of infringed copy of software intentionally, the amendment which was introduced under Section 63B in 1994 mentions, about punishment with imprisonment and fine.[59] Proviso to the section sets out penal liability even if the pirated copy has not been used for profit or business which means even fair use of a pirated copy is not allowed.[60] The test of substantial similarity is also impliedly followed in India just like in US Copyright law by various tests like AFC (Abstraction Filtration Comparison) test etc.[61]

Criminal liability for other forms of software piracy by person other than the end-user is also given under the Act. Apart from punishments of the piracy, there are provisions which allows specific situations where copying will not be considered infringement. Under Section 52(1) (aa) to (c) mentions the exceptions to use of Computer Programs in following circumstances:

1. Making copies or adaptation of it to use it or make backup copies of it in temporary form.

2. Doing of any act necessary to obtain information which is not easily available.

3. To observe, study or test the functioning of the computer program to learn the principals involved in it.

4. Making copies for personal use from the original program which is legally bought.

5. Transient or incidental storage of a work.

The Proviso under clause (c) explains the situation if any person who has some work stored in transient or incidental and if the owner of that work tells him/her to stop using it, he/she will not be allowed to use it till 21 days and will be allowed only if a competent court uplifts this

[58] The Copyright Act, 1957 (Act 14 of 1957), Section 63 'Offences of infringement of copyright or other rights conferred by this Act'.
[59] The Copyright Act, 1957 (Act 14 of 1957), Section 63B 'Knowing use of infringing copy of computer program to be an offence'.
[60] The Copyright Act, 1957 (Act 14 of 1957), Section 63B Proviso *"Provided that where the computer program has not been used for gain or in the course of trade or business, the court may, for adequate and special reasons to be mentioned in the judgment, not impose any sentence of imprisonment and may impose a fine which may extend to fifty thousand rupees."*
[61] *Computer Associates International v. Altai*, 982 F. 2d 693 (Fed. Cir. 1992).

restriction.[62] The provisions under this Act are mostly added in 1999 or 2012, which are the time when advancements in technology were its peak.

2. The Information Technology Act, 2000

This Act explains the offences network service providers with respect to the protection of copyright. It is probably the only Act which defines 'Computer' under Section 2(1) (i).[63] Software is included in the definition of 'Computer resources' under clause (k) of the same section and Computer Programs are included in 'Computer Systems' which are mentioned under clause (l).

The Act has proved to be a very strong one with respect to the penal provisions it has relating to cybercrimes. Under Section 65, concealing, destroying, or altering of the source codes of Computer Programs can be punished.[64] The acts which this provision punishes are not per se subject matter of software piracy but during the process of such piracy these acts are being done, and hence are punishable. Also, under Section 66 covers all types of computer related offences and prescribes punishment for them.[65]

Act mentions about the intermediaries which are online software and are prone to get infringed.[66] In April 2011, the Ministry of Communications and Information Technology notified the rules regarding guidelines to the intermediaries under section 79 of this Act.[67] The due diligence to be observed by the service providers was given in the form of rules and it mandates the intermediaries to publish rules and regulations to its subscribers who use their service, particularly with a rule not to upload or host any content which infringes copyright in the service provider's computer resource. The rule introduces new take-out policy which was not present under any action concerning copyright infringement. It also authorizes the intermediary to inform, terminate the access and remove the infringed contents of its users

[62] The Copyright Act, 1957 (Act 14 of 1957), Section 52(1)(c) Proviso *"Provided that if the person responsible for the storage of the copy has received a written complaint from the owner of copyright in the work, complaining that such transient or incidental storage is an infringement, such person responsible for the storage shall refrain from facilitating such access for a period of twenty-one days or till he receives an order from the competent court refraining from facilitating access and in case no such order is received before the expiry of such period of twenty-one days, he may continue to provide the facility of such access."*
[63] The Information Technology Act, 2000 (Act 21 of 2000), Section 2(1).
[64] The Information Technology Act, 2000 (Act 21 of 2000), Section 65 'Tampering with computer source documents'.
[65] The Information Technology Act, 2000 (Act 21 of 2000), Section 66 'Computer related offence'.
[66] The Information Technology Act, 2000 (Act 21 of 2000), Section 2(1) (w) 'Intermediary'.
[67] Information Technology (Intermediaries guidelines) Rules, 2011.

anytime in the event of non-compliance with the rules. Now, the network service providers have a collateral responsibility to check the piracy over their services and are supposed to be operative, wherever necessary, in protecting the interest of the copyright holders.

III. ANOMALIES FACED BY SOFTWARE DEVELOPERS: CIRCUMVENTION MEASURES BY INFRINGERS OF SOFTWARE PROGRAMS

The preceding section dealt with copying of the programs directly or substantial part of it, but there are circumstances where the infringers do act which helps in overcoming the hindrances in usage of a particular computer program. For instance, if A wanted to read an article which can only be read in Adobe Application format for which the original software is not available. So, the article could not be viewed. So, A prepares a software which can remove the hindrance involved in reading of that article. The act done by A in this case can be called a circumvention method which is akin to removing of software related hinderances. In this situation, the right of the author who wrote that article is hampered and at the same time, the rights of owner of program Adobe is also impeded. It is a different kind of difficulty faced by software developers which makes it important to analyze the protection laws relating to it.

A. WIPO COPYRIGHT TREATY, 1996 (WCT)

The WCT provide the protection of member nations in technological measures. According to Article 11[68], the contracting states shall have an obligation to provide adequate legal protection and effective legal remedies against the circumvention of effective technological measures that are used by authors in connection with the exercise of their rights under the WCT or the Berne Convention that restrict acts, in respect of their works, which are not authorized by the authors concerned or permitted by law.

Article 12 of WCT, provides the obligations of member states concerning Rights Management Information.[69] As per Article 12, the member states shall have the obligation to provide adequate and effective legal remedies against any person for knowingly inducing, enabling, facilitating or concealing removal or alteration of any electronic rights management information without authority and for inducing, enabling, facilitating or concealing distribution, import for distribution, broadcast or communication to the public, without

[68] WIPO Copyright Treaty, 1996 Article 11 'Obligations concerning Technological Measures'.
[69] WIPO Copyright Treaty, 1996 Article 12 'Obligations concerning Rights Management Information'.

authority, works or copies of works knowing that electronic rights management information has been removed or altered without authority.

B. U.S. COPYRIGHT ACT & DIGITAL MILLENNIUM COPYRIGHT ACT, 1998

While most of the cases involve circumvention devices, a few cases have arisen concerning the act of circumvention. Although some courts have held that an unauthorized person's use of an actual password does not circumvent but this interpretation appears inconsistent with the statute. Under Section 1201(a)(3)(A) of US Copyright Act defines "to circumvent" as *"to descramble a scrambled work, to decrypt an encrypted work, or otherwise to avoid, bypass, remove, deactivate, or impair a technological measure, without the authority of the copyright owner".*[70]

Entry of the password deactivates the measure that restricts access if the password is utilized by an unauthorized user, and then the deactivation will not have occurred with the copyright owner's authority.[71] US government implemented the international treaties by passing the Digital Millennium Copyright Act (DMCA) in the year 1998.[72] This is a step taken by USA towards anti-circumvention measures. It also prohibits manufacture, import, sale or other traffic in any product, service, device, component or part, which is primarily designed or produced for the purpose of circumvention or which has a limited use other than circumvention.

The integral part is Title III, which expands the existing exemption relating to Computer Programs in Section 117 of US Copyright Act, which allows the owner of a program to make reproductions or adaptations when necessary to use the program in conjunction with a computer.. The amendment permits the owner or lessee of a computer to make or authorize the making of a copy of a computer program in the course of maintaining or repairing that computer.

The exemption only permits a copy that is made automatically when a computer is activated, and only if the computer already lawfully contains an authorized copy of the program. The new copy cannot be used in any other manner and must be destroyed immediately

[70] U.S. Copyright Act, Title 17, Chap. 12 § 1201 'Circumvention of Copyright Protection Systems'.
[71] Jane C. Ginsburg, 'The Pros and Cons of Strengthening Intellectual Property Protection: Technological Protection Measures and Section 1201 of the Us Copyright Act', Columbia Public Law Research Paper No. 07-137 (2007).
[72]The Digital Millennium Copyright Act of 1998 (U.S. Copyright Office Summary) https://www.copyright.gov/legislation/dmca.pdf accessed 3 November 2022.

after the maintenance or repair is completed. Exemptions have been provided in the section for nonprofit library, archives, or educational institution to gain access to a commercially exploited copyrighted work solely in order to make a good faith determination of whether to acquire a copy of that work. The stringent provisions of DMCA have led to a large number of unintended consequences like arrest of scientists, numerous law suits, stoppage of research, etc.

C. EUROPEAN UNION DIRECTIVE ON COPYRIGHT AND RELATED RIGHTS

The European Union Directive on copyright and related rights in the information society was adopted by the European parliament in the year 2001 with an aim to implement the provisions of WCT and WPPT. The Directive mandates the implementation of the WIPO treaties by EU members.

However, EU members have significantly harmonized their national copyright laws since 1991 as a result of which several EU Directives aimed at vertical standardization, including the Software Directive, Rental Right Directive, Satellite and Cable Directive, Term Directive, Database Directive and the Artists' Resale Rights Directive. In the specific context of this paper, the most important piece of EU legislation is the Directive 2001/29/EC, also known as the European Copyright Directive (EUCD), came into force on June 22, 2001.[73] Its purpose is twofold: 1) to harmonize the divergent European copyright regimes that were increasingly seen as an obstacle to the EU single market and as not yet ready for the information age, and 2) to transpose the WIPO Internet Treaties.

Still pending implementation in some member states, the EUCD sets the European Community legal framework for copyright by standardizing three fundamental exclusive rights, introducing an exhaustive list of copyright exceptions, and stipulating obligations on safeguarding Technological Protection Methods.[74] The EU directive provides that the member states shall be provided adequate legal protection against the circumvention of any effective technological measures, designed to prevent or restrict acts not authorized by the right holders

[73] 'Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonization of certain aspects of copyright and related rights in the information society' (OJ L 167, 22/06/2001 P. 10 – 19) https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32001L0029:EN:HTML accessed 28 October 2022.

[74] Urs Gasser, 'Legal Frameworks and Technological Protection of Digital Content: Moving Forward Towards a Best Practice Model', The Berkman Center for Internet & Society of Harvard Law School, Research Publication No. 2006-04 (June 2006).

of any copyright.

It further provides that the member states shall be provided adequate legal protection against the manufacture, import, distribution, sale, rental, advertisement for sale or rental, or possession for commercial purposes of devices, products or components or the provision of services which are promoted, advertised or marketed for the purpose of circumvention of, or have only a limited commercially significant purpose or use other than to circumvent, or are primarily designed, produced, adapted or performed for the purpose of enabling or facilitating the circumvention of any effective technological measures.[75]

The Directive further mandates that the member states shall provide for adequate legal protection against any person for knowingly removing or altering any electronic right management information and for distributing, importing for distribution, broadcasting, communicating, or making available to the public of works or other subject-matter from which electronic rights-management information has been removed or altered without authority.[76]

D. INDIAN LAWS

In India, unfortunately there is no separate law talking about circumvention and anti-circumvention measures which are a necessity in today's scenario. But under Information Technology Act and Copyright Act, there are provisions which provides for anti-circumvention measures and help in protecting rights of copyright owners. It is unfortunate to see that with governmental policies like Digital India[77] and Startup India[78] coming up; India is not well equipped with sensitive intellectual property matters. After amendment in 2012 in Copyright Act, the Digital Rights Management provisions have been introduced which are considered criminal offence.

IV. ANOMALIES FACED BY SOFTWARE DEVELOPERS: MORAL RIGHTS OF SOFTWARE DEVELOPERS

Computer software has been integrated entirely into the purview of copyright laws. At the same time, software, and related technological challenges at a fundamental level, raising

[75] Ibid
[76] Ibid
[77] Digital India, https://www.digitalindia.gov.in/ accessed 29 October 2022.
[78] Startup India, https://www.startupindia.gov.in/ accessed 29 October 2022.

several questions that needs to be addressed before the relationship between copyright and software can be called harmonious. The concept of moral rights takes us straight to the heart of dilemma. Moral rights can provide the basis for a better model of IP protection for software.[79] The primary question which we should be asked is whether moral rights apply to 'literary' forms of work or not? To answer that Article 6bis of the Bern Convention talks explicitly about moral rights in copyright works. This clears the point that the authors and developers of Computer Programs have moral rights subsisting in their work.

A. JURISPRUDENCE OF MORAL RIGHTS FOR SOFTWARE DEVELOPERS

Legal protection for moral rights assumes that the work is an extension of its author's personality, so that any damage to the work will cause harm to the author. Is this the same relationship between a programmer and his Computer Program? It is important to resolve this question, as it holds the key to finding an effective balance between the interests of the programmer and the interests of those seeking access to the program. At any cost the rights of the developers lies in the situation, that any distortion, mutilation and modification of any of his works can't be done without developers permission and due consent.

Moral rights in information technology should be based on three guiding principles: the promotion of technology, the protection of the relationship between a human author and his work and the recognition of the human rights of programmers and artists working with programmers. It is often said that moral rights protect the personality of the author, as expressed in his work. The work is the reflection of his personality, which gets damaged and so damaging the personality of the author and thus the author himself. This could be termed the 'aesthetic' rationale for moral rights, but it is not the only one. Rather, the problems with the moral rights deserve to be considered from a human rights perspective. The reasons for restraining moral rights in software mainly reflect a public interest rationale the concern that excessive protection for programmer's rights in the computer industry will inhibit growth and development in this crucially important field.

The issue gets triggered by the very nature of software, which combines functional and design elements in the creation of a program and may often do so in particularly inseparable ways. In relation to moral rights, this problem is compounded by the fact that copyright in most

[79] Mira T. Sundara Rajan, 'Moral Rights in the Digital Age: New Possibilities for the Democratization of Culture', 16 (2) International Review of Law, Computers & Technology, 187-197 (2002).

Computer Programs may be owned by corporations, who acquire copyright in them through the operation of work for hire rules governing ownership.

It is largely presumed in the international copyright community which seems to accept the tacit assumption that moral rights are not applicable to Computer Programs under existing copyright regimes, and that there is no need to extend them to software. Excluding moral rights is a hasty and ill-advised approach to the question of creator's right in a technology environment. This assumption is very premeditated because software programs as an institution are growing every year and we can expect new developments also, so due credits need to be given to the developers who put in their hard work and intellect in designing of programs.

There are countries that still support the argument that moral rights should be given. Like India and France ultimately reach the conclusion that software development is not promoted by eliminating programmer's moral rights. Instead, the exclusion of moral rights may bring inconsistency to copyright protection for software as a kind of literary work, while preventing programmers from receiving what is rightfully their due. An honest attempt should be made to investigate the implications of technology for moral rights and develop the proper legal formulae for their recognition.

B. MORAL RIGHTS PROVISION IN COPYRIGHT LAWS OF VARIOUS COUNTRIES

The EU approach to moral rights in software confirms the belief that, there is no outright prohibition on moral rights for programmers in European law. In the provisions, a comparison of moral rights for software with general provisions on moral rights reveals a somewhat restrictive approach to their availability under national legislation. On the other hand, The United Kingdom Copyright, Design and Patents Act, 1988 explicitly provides that neither the moral rights of attribution nor the right of integrity shall apply to Computer Programs.[80]

In case of New Zealand, it might be the only common law country which follows the UK approach. Australia, in its well-developed scheme for moral rights, has not done so, neither has Canada. Canadian government's current reform bill does not indicate any plans to address the possibility of moral rights for programmers. South African Copyright law is one where the moral rights of authors of computer program have been mentioned.[81] Under the Brazil

[80] U.K. Copyright, Designs and Patents Act, 1988, Section 79(2) (a) & 81(2).
[81] *Supra* note 57

Software Act of 1998, Section 2(1) specifically mentions that *"no provisions relating to moral rights do not apply to software programs, expect at any time, the author's right to claim the authorship of the software".*[82] The importance of these rights is only understood by the developers who don't get enough credit for their intellect and skills. It is high time we start giving importance to their hard labour.

In contrast, India is another common law jurisdiction, which does not exclude moral rights in Computer Programs protection.[83] In an Indian case, *Statart Software Pvt. Ltd. v. Karan Khanna*[84], Indian judges considered the issue of whether a company's modification of a Computer Program developed by two former employees to personalize templates of letters amounted to an infringement of their moral right of integrity. The parties eventually reached a settlement without going to court; however, notice of the dispute was taken by Indian government which appears to have responded by introducing the exception to integrity right in Section 57 of Indian Copyright Act.[85]

V. CONCLUSION

Logical derivation from the above-mentioned analysis could be made that software piracy, circumvention issues and moral rights of developers are an alarming issue today and it is the need of need of the hour for enactment of stronger IP laws for the protection. The analysis of laws of BRICS countries with comparison to USA and UK gives a strong standpoint for India to develop an IP friendly society. India having one of the highest numbers of Computer Science engineers, demands stronger protection mechanisms. Even though TRIPS has made sure to cover as many aspects as possible, but with change in time in developing technology, there is a need for improvisation. Also, because of the increase in number of hackers the development in the field of Computer Programs have become more interesting but at the same time defeats the entire motive of intellectual protection of the original owner of the software.

It is to be noted that India is moving with a reasonable pace about the protection mechanism of the programs but there is more scope of improvement with regards to the moral rights of the authors of Computer Programs. The basic rights on works created by the software developer should be provided regardless of them being a freelancer or an employee of a software

[82] Ibid
[83] The Copyright Act, 1957 (Act 14 of 1957), Section 57 'Author's special rights'.
[84] Suit 1267 of 1991 (India).
[85] Ibid

developing company. Constitutional law should act as a safeguard in protection of moral rights otherwise software developer's rights will remain in unconsidered and be taken for granted. Even though criminal sanctions are mentioned in Indian IP laws but the implementation are lacking because of less number of reported cases.[86] Also, there should be a collaborate effort of all the member countries in making protection mechanisms for software developers.

[86] India ranks third globally for consuming pirated content in 2021: Akamai Report, Available at https://indianexpress.com/article/technology/tech-news-technology/india-ranks-third-globally-for-consuming-pirated-content-akamai-report-7753275/ accessed 3 November 2022.