INFRINGEMENT OF COPYRIGHT IN COMPUTER PROGRAMS IN INDIA- UNDERSTANDING THE STATE OF VIRTUAL *NON-LIQUET* AND CHALLENGES *VIS-À-VIS* ARTIFICIAL INTELLIGENCE

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Abstract

With the gradual changes in the technological outlook of the society and greater intervention of technology in day-to-day lives, the importance of technological intercourse in law has increased manifold. The advent of Artificial Intelligence *(hereinafter "AI")* is one path breaking development that has given rise to various conventional and unconventional concerns having a direct bearing on the intellectual property laws in general and on copyright laws in particular. Whereas the global world, the European Union and United States in particular, has taken due cognizance of these developments, India still stands far behind. India's lagging behind is not just on account of the lack of legal development in the above-mentioned domain of law but also in terms of its lack of recognition of the same. Whereas section 2(o), Copyright Act, 1957[1] *(hereinafter referred to as the "Act")* puts computer programs in the wide category of 'literary works', which subsequently fall under the category of works in which copyright subsists under section 13 of the Act, the scope and extent of such protection is yet to be seen. Moreover, in addition to the scope and extent, it is also to be seen whether copyright is a strong enough right to protect computer programs from being infringed or one has to go and seek protection from the Patents Act, 1970. The authors would also explore how the distinction between the literal and non-literal aspects of the computer programs are characterised by a different set of elements and therefore, deserve a different approach in deciding their infringement. Furthermore, the paper would also analyse how the growing advent of AI in computer programs of common use poses greater challenges to the protection framework of the intellectual property laws in India.

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[1]The Copyright Act, 1957 (14 of 957), s. 2(o): reads: "literary work" includes computer programmes, tables and compilations including computer [databases].

I Introduction

How does a computer program work?

A COMPUTER program while mechanically operated lacks the characteristics of a machine, device, or invention encompassed by the patent laws. In fact, a computer program constitutes a writing ('a set of statements or instructions') and on this basis the law of copyright has been expanded to include this new form of 'literary work'. In order to understand the challenges and legal implications surrounding copyright in computer programs, it is important to understand the basic nature of functioning of the programs, their construction, compilation and execution in a fundamental sense. As per section 2(ffb),[2] "computer" includes any electronic or similar device having information processing capabilities." Moreover, a "computer programme"[3] is defined as "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." This definition quite explicitly distinguishes between the "set of statements or instructions" constituting the "computer program" and the "certain result" that the program brings about *via* execution by the computer. The natural reading of this definition leads to the conclusion that the computer program is, quite simply, the code.

A computer is receptive to multiple kinds of programming languages, but when it comes to execution of the programs, it is receptive solely to the binary language, that is, 0s and 1s. Programs expressed in different languages ought to be converted into binary form so as to enable the computer to execute them.[4] The representation of a language in binary form is termed as machine language. Illustratively speaking, an instruction in machine representation may aggregate numbers, shift data across multiple memory locations or even deduce whether a given number equates to zero. In practical parlance, the programs are not directly expressed in the machine form and thus, a limited number of programmers can readily deduce this language. Alternatively, the computer programs are expressed in the form of a set of instructions often termed as the "source code". This code falls under "literary works" under the Act and is duly protected.[5]

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[2] *Id.*, s. 2(ffb).
[3] *Id.*, s. 2(ffc).
[4] See generally, McGraw-Hill, VII *Encyclopaedia of Science and Technology* (McGraw Hill Higher Education, Columbus, 7th edn., 1992).
[5] The Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPs), 1995.

Once the source code is written, the "object code" is deduced using a computer program known as assembler or compiler. The usage of assembler or compiler is determined on the basis of the language of the program. The transformation of a program written in high level language requires a compiler and one written in a low-level assembly language requires an assembler. The outcome of this process is the generation of a machine-readable code – a binary series of 1s and 0s – that can be directly perceived by a computer, though virtually impossible for human understanding. This binary form of the program is termed as the "object code". Evidently, the underlying idea of an object code does not reveal itself from a perusal of the code, a feature distinct from other literary works.[6]

Steps involved in reaching the final result

The journey from the original idea to the finished product runs across a multiple step process. At every step of the journey, the developer moves away from the general idea and steps towards specificity. *Firstly*, the developer determines the ulterior purpose of the program. *Secondly,* the developer decides the range of functions desired for accomplishing the needs of the user. *Thirdly,* the over-all structure of the software is crafted or designed. This process involves breaking down the broad functions of the program into sub-tasks, thereby facilitating the developer to understand. Each such function or sub-task is designated as a "sub-routine" or a mini program squared within the main program. These subroutines are further broken down into smaller subroutines and the process goes on until each subroutine performs a relatively minor but simple task so as to make it easily programmable. Thereafter, the array of subroutines is recompiled in a logical pattern so as to produce the desired effect. Practically, these steps are earmarked in the shape of a flow chart, that serves as a foundation for expressing the program code.[7]

What emerges out of the above process is that merely writing down the actual codes is only a miniscule part of development and significantly higher volume of creative effort is invested into the aspects of conceptualisation and design. It is this latter aspect of program development where real creativity goes in and therefore, the real mischief of the copyright law should be targeted in affording sufficient protection to not just the literal code, but also to further elements.

[6]Velasco Julian, "The Copyrightability of Nonliteral Elements of Computer Programs" 94 *Columbia Law Review* 244 (1994).
[7]John Abbot, "Reverse Engineering of Software: Copyright and Interoperability" 14 *Journal of Law, Information and Science* 7 (2003).

II Extent of protection in computer programs

What was the *raison d'etre* behind affording protection to functional elements like computer programs under the copyright laws? The underlying essence of the protection is evident from the fact that copying of codes, which are ineligible for protection under the patent laws, is swift, easy and inexpensive, irrespective of how expensive the original creation is. Succinctly put, the codes are vulnerable elements and are prone to copying in an unregulated fashion. In copying of patented creations, various processes are involved that need to be re-worked and re-tested and mere copying would not enable any competitor to immediately start exploiting it. On the contrary, copying of a computer program can enable any competitor to indulge into production activities without further expense or delay. Thus, copying of a computer program could enable a competitor to avoid multiple expenses of testing and development. Though the discussion whether a computer program actually fits in the category of literary creations shall stay alive, the fact of the matter is that the amount of creativity cannot be judged on the basis of whether a subject matter is copyrightable or patentable. In a traditional sense, such creations would have fallen under patent laws or trade secrets. However, their inclusion in literary creations should not derogate the extent of protection that they deserve. The shortcomings in the protection offered to these programs under the copyright laws has raised serious concerns regarding the extent of protection that law can afford to the computer programs, thereby leaving the programmers to seek twin protection from both copyright law as well as from patent law under one pretext or the other.

III Expression, not idea

It is a fundamental principle of copyright law that copyright protects the expression of an idea, but not the idea itself.[8] This is because the primary objective of copyright law is to "promote the Progress of Science and the useful Arts".[9] Therefore, copyright acts to encourage people to build freely on the ideas of others, while, secondarily, protecting the rights of authors' in the original expression of their ideas.[10] However, finding the line that separates idea and expression is one hurdle that "nobody has ever been able to fix". This is especially true for computer programs because they are fact intensive yet highly creative and

[8] *Baker* v. *Selden,* 101 U.S. 99, 102 (1879).
[9] *Ibid.*
[10] *Feist Publications, Inc*. v. *Rural Tel. Serv. Co., Inc.*, 111 S. Ct. 1282, 1290 (1991).

so technically challenging that courts find them difficult to understand. This problem of drawing a point of distinction assumes significance on a bare understanding that the only test in India that governs the comparison between two computer programs is the test of facial similarity enunciated by the court in case of *R.G Anand.*[11] Interestingly, the test was evolved to compare cinematic works and the application of the same parameters to compare two computer programs is manifestly absurd. However, despite this absurdity, opinion of the viewers is being followed to compare two programs.

The breadth of copyright protection a court extends to a computer program is directly related to where that court draws the line between idea and expression. Over the years, the protection that copyright law extends to computer programs has expanded. Originally, copyright law protected only the written codes that made up computer programs.[12] Gradually, however, courts extended this protection to include the non-literal structure and organization of computer programs.[13] Affording protection to such elements of the program became all the more important with the society becoming increasingly dependent on technology for basic needs. With the rise in demand, supply is also being increased, thereby leading to a series of similarities and infringements in the supply chain. Before delving into the extent of protection, if at all, accorded to non-literal elements, the authors feel it is important to understand the dichotomy between idea and expression.

The idea-expression duality

The duality prevailing around idea and expression in the copyright law assumes significance when the court has to adjudge the protection to be offered to the non-literal elements of a computer program.Broadly speaking, non-literal elements in a program pertain to the overall structure, sequence and organization of the elements of a program and not to the written codes. In the earlier stages of legal developments in this area, the expressible elements were termed as the expression and the non-expressible elements were termed as mere idea. In *Nichols* v. *Universal Pictures Co.,*[14]it was famously remarked with respect to this distinction that, "Nobody has ever been able to fix that boundary, and nobody ever can". However, this

[11]*R.G. Anand* v. *Deluxe Films*, 1978 AIR 1613, division bench judgment.
[12]*Johnson Controls* v. *Phoenix Control Sys.*, 886 F.2d 1173, 1175 (9th Cir. 1989).
[13]Dennis M. McCarthy, "Copyright Infringement - Redefining the Scope of Protection Copyright Affords the Non-Literal Elements of a Computer Program" 66 *Temple Law Rev.* 273 (1993).
[14]*Nichols* v. *Universal Pictures Co.*, 45 F.2d 119, 121 (2nd Cir. 1930).

inability on the part of courts could not be used as an excuse to deprive the lawful extent of protection to a rightful claimant.

Initially, one of the first courts that dealt with the protection to be afforded to non-literal elements simply brushed aside the possibility of any protection by stating that anything over and above the literal expression of a program is nothing but an idea, and therefore, non-protectable.[15] This was said to be a very strict interpretation and proved to be fatal to the developers' creativity. This dichotomy of idea and expression became crucial because copyright law aimed to cover expressions and whatever was termed as Idea by the courts automatically fell outside the purview of protection. Thereafter, it was the *Whelan* v. *Jaslows*[16]case, when the court expanded the scope of interpretation of the computer program and removed the label of idea from the non-literal elements.

Understanding literal and non-literal elements of computer program

'Literal' refers to the program code itself, and literal elements are those elements that are concerned with the literary aspects of a computer program, that is, the codes expressed in literary language. Direct copying of a code is termed as literal copying and by the process of reverse engineering, such copying has become an easy feat in the software industry.[17] On the other hand, non-literal elements may include such things as the structure of the code. These elements look beyond the literary aspects and are primarily identified through the structure, sequence and arrangement of the working of a computer program. As observed in *Computer Associates*[18]case, these elements are not reduced to the written form and are often found to be embedded in the overall 'look and feel' of the program.[19] This distinction between the two becomes extremely crucial as two programs may not have the same codification underneath them, but could still be infringing each other due to the striking similarity of their sequence and structure.[20]

[15]*Synercom Technology, Inc.* v. *University Computing Co.,* 462 F.Supp. at 1014.
[16]*Whelan Assocs., Inc.* v. *Jaslow Dental Laboratory, Inc.*, 797 F.2d 1222.
[17]*John Abbot*, *supra* note 7.
[18]*Computer Associates International Inc.* v *Altai Inc*., 23 U.S.P.Q. (2d) 1241 at 1244 (2d Cir. 1992).
[19]M Bergner, "Changing Views: A Comment on Intellectual Property Protection for the Computer User Interface" 42 *St Louis Law Journal* 301 (1998).
[20]Robert L. Jr. Bocchino, "Computers, Copyright, and Functionality: The First Circuit's Decision in Lotus Development Corp. v. Borland International, Inc." 9 *Harvard Journal of Law and Technology* 467 (1996).

Protecting literal and non-literal elements of a computer program

Literal

The Copyright Act, 1957 provides statutory protection to the literal elements of a computer program. This protection is against direct copying of the codes of a program and is statutorily available because all the steps involved in such copying could be traceable either directly or through the process of reverse engineering. By virtue of earliest landmark verdicts in *Williams Electronics, Inc.* v. *Artic International, Inc.*[21]and *Apple Computer, Inc.* v. *Franklin Computer Corp.*[22],the courts dealt with the copyrightability of literal aspects or the coded aspects of computer programs. The coded aspects are directly covered under the expression "literary work" in the Act. Thus, the fundamental copyrightability of the literal elements of computer programs was duly established and the same is not contested in the present research. After these early cases, it was clear that the literal elements of all types of computer programs, whether applications or operating systems, "were copyrightable in any format, whether source code or object code."[23]The literal elements of all types of computer programs, whether applications or operating systems, are copyrightable in any format, whether source code or object code.[24]So, our concern here attributes to the non-literal elements.

Non-literal

The user interface of a computer program, manifested in its structure, sequence and organizations constitutes the non-literal elements of a computer program. An author is more concerned about the protection of the interface of the program as compared to its literal aspects manifested in the source code and object code. The concern of authors with respect to the user interface gets enhanced as it has been witnessed in the industrial practices that different source codes could lead to similar appearing user interfaces, thereby leaving the authors with little to seek in the name of protection from the law. The idea-expression dichotomy can also be found in the field of 'compilations'. Compilations include a work constituted by an assemblage of existing data or information and creativity lies in the process of selection, coordination, or arrangement in such a way that the resulting work looked as one single whole constitutes an original work.[25] The distinction between idea and expression in this area also becomes complex as the assemblage of the same data in an end product comes

[21]*Williams Electronics, Inc.* v. *Artic International, Inc.,* 685 F.2d 870 (3d Cir. 1982).
[22]*Apple Computer, Inc.* v. *Franklin Computer Corp.,* 714 F.2d 1240 (3d Cir. 1983).
[23]*Velasco Julian*, *supra* note 6 at 258.
[24]Michael D. Scott, *Scott on Computer Law*, 3-47 (Aspen Law & Business, New York, 2nd edn., 1992).
[25] 17 U.S.C. §§ 101-914 (1982 and Supp. IV 1986).

with fewer expressions and thus, the overlapping between idea and expression is more frequent and significant. Compilations of data include works such as directories, maps, catalogues and indexes. It is possible even for works consisting entirely of otherwise uncopyrightable elements to be protected under this rubric.[26]

At this juncture, we observed that the common thread running across various judicial decisions, discussed above, and legislations including the Berne Convention, 1886,[27] convey that the literal elements of a computer program are subject matters of protection. Therefore, the real issue prevails in the scope of protection for non-literal elements. The courts in a line of judicial decisions have evolved four major tests of identifying protection and consequential infringement in non-literal elements. The pace of judicial development in this area of law has been the most effective in United States jurisdiction, as discussed above and thus, the said judicial developments are being used as a pivot for a comparative analysis around it. Let us undertake a brief analysis of the tests and explore the possibility of such tests in the Indian context as the state of judicial decisions with respect to non-literal elements in India is 'null' or more appropriately put- a state of *non-liquet* or lawlessness.

The *Whelan* approach

In *Whelan Associates, Inc.* v. *Jaslow Dental Laboratory, Inc.,*[28] the court first answered the question whether the non-literal elements of a computer program are copyrightable at all and while answering in the affirmative, the court moved on to the main aspect of the case. It began by noting that the copyrights of other literary works could be infringed without any copying of the literal elements of the work. Therefore, the court reasoned, the same should be true of computer programs. After reiterating the distinction between ideas and expression, the court developed a test, purportedly based on *Baker* v. *Selden,*[29]for distinguishing idea from expression in computer programs:

> The line between idea and expression may be drawn with reference to the end sought to be achieved bythe 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

[26]*Feist Publications*, *supra* note 10.
[27]Berne Convention for the Protection of Literary and Artistic Works, 1886.
[28]*Whelan*, *supra* note 16.
[29]*Baker*, *supra* note 8.

> various means of achieving the desired purpose, ... the particular means chosen is not necessary to the purpose; hence, there is expression, not idea.

Interestingly, the court also noted that the real reason behind such reasoning is the public policy. This test was criticised for being too simplistic as the identification of idea and expression in a computer program is not as easily distinguishable and therefore, the practical application of this test was put to scrutiny. Apart from this, it is also to be seen whether the Indian courts can apply a certain test on the basis of public policy, a domain vested with the legislature and executive.

The *Paperback* approach: A three-part test to determine copyrightability

The second approach was enunciated in the case of *Lotus Development Corp.* v. *Paperback Software International,*[30] in which the court examined whether the interface of a program is protected. While answering this question, the court formed a three-part test:

Firstly, in making the determination of 'copyrightability', the decision maker must focus upon alternatives that counsel may suggest, or the court may conceive, along the scale from the most generalized conception to the most particularized, and choose some formulation or conception or definition of the 'idea'- for the purpose of distinguishing between the idea and its expression.

Secondly, the decision maker must focus upon whether an alleged expression of the idea is limited to elements essential to expression of that idea (or is one of only a few ways of expressing the idea) or instead includes identifiable elements of expression not essential to every expression of that idea. In this step, the court took into account the doctrine of merger wherein idea and expression merge in such a manner that affording any sort of protection to the expression would be tantamount to affording protection to the idea itself.

Thirdly, having identified elements of expression not essential to every expression of the idea, the decision maker now focuses on whether those elements are a substantial part of the alleged copyrightable 'work' and whether their imitation would deprive the program of its fundamental creativity that distinguishes it from others. In addressing this element of the test

[30]740 F.Supp.37 (1990).

for copyrightability, the decision maker measures what is substantial to his creation in a qualitative sense. The purpose of this step is to ensure that the court focuses only on those elements that are eligible for protection and other generic or non-substantial elements are weeded out. It is at this step that court actually compares the two works and checks whether the substantial elements of the work are substantially similar with the substantial elements of the other works. However, this test was later found to be restricted to the interface aspect of the program and could not be used as a precedent to determine infringement in the sequence of underlying elements and features that lay behind the interface. Another criticism that has been levelled against the result in *Paperback* is that copying the user interface of a *de facto* standard product is necessary to achieve standardization and compatibility in the software industry. However, the court considered and rejected this argument as well, stating that "the desire to achieve 'compatibility' or 'standardization' cannot override the rights of authors ....".[31] One last criticism often made against *Paperback* is that since "innovation occurs by building on previous works"[32] programmers should be free to borrow and improve upon the ideas of other programmers.

Extrinsic- intrinsic test

This test was enunciated in *Brown Bag Software* v. *Symantec Corp*.[33] The first phase of that test is the 'extrinsic test' which involves an 'objective analysis of expression'. In this phase, individual elements of the copyrighted work are analytically dissected-and unprotectable elements of expression eliminated from consideration-in order to define the scope of the plaintiff's copyright. The second phase of the extrinsic-intrinsic test is the 'intrinsic test'. It is triggered only in cases where the court finds objective similarities of protected expression. The 'intrinsic test' is a subjective test that measures, "substantial similarity in expressions... depending on the response of the ordinary reasonable person ..."[34] It compares the protected elements determined under the 'extrinsic test' to assess-without the help of analytic dissection or expert testimony- whether there is substantial similarity in the 'total concept and feel' of the two works.

[31]*Ibid.*
[32]*Rosenthal* v. *Stein*, 205 F.2d 633, 635-37 (9th Cir. 1953).
[33]960 F. 2d 1465, 9th Circuit 1992.
[34]*Ibid.*

The ultimate objection that lies in this test is that once the first limb of the test fails to apply, one cannot go into the second limb, *i.e.,* actual comparison between two things is not certain to be done. Since under the 'extrinsic test' the court dissects the program into its elements and analyses each element's copyrightability individually, the court may never consider whether the program as a whole deserves copyright protection. Therefore, the method adopted by the court here is prone to easy manipulation as there can be instances when sub-elements of a program may not be similar but the ultimate expression it similar. If the court restricts itself to dissection of the program, without going into a further analysis of the end product, the test falls short of the desired protection. Moreover, the whole basis of comparing two complex subjects like computer programs on the basis of 'total look and feel' is manifestly arbitrary.Interestingly, similar test was propounded by the Indian courts in *R.G Anand* v. *Deluxe Films*[35]based on the total look and feel, as enunciated at an appropriate stage later.

***Altai* approach- The abstraction – filtration – comparison test (AFC)**

Enunciated in *Computer Associates International, Inc.* v. *Altai, Inc.,*[36] this test is the most advanced and most widely followed test as far as copyrightability in non-literal elements of a computer program is concerned. In determining whether the non-literal elements of the program were copyrightable, the second circuit noted, as did the previous courts, that copyright protection generally extends beyond a literary work's strictly textual form to its non-literal elements of expression. The court therefore looked to the idea-expression dichotomy in deciding the case. However, the court rejected the *Whelan* approach as simplistic and conceptually overbroad, announcing instead its own 'Abstraction-Filtration-Comparison' or more popularly known, AFC test. Let us understand this test and its adaptability in Indian context.

It begins with 'abstraction', a process resembling reverse engineering which entails the breaking down of a program into its components into literal and non-literal elements.[37] The second step, calling on traditional principles of copyright, filters out those elements of the program that are not copyrightable: This process entails examining the structural components at each level of abstraction to determine whether their particular inclusion at that level was

[35]*R.G. Anand*, *supra* note 11.
[36]982 F.2d 693 (2d Cir. 1992).
[37]*Computer Assocs. Int'l, Inc*. v. *Altai, Inc.,* 775 F. Supp. 544, 560 (E.D.N.Y. 1991).

'idea' or was dictated by considerations of efficiency, so as to be necessarily incidental to that idea; required by factors external to the program itself or taken from the public domain and hence is non-protectable expression. Elements 'dictated by considerations of efficiency' are to be excluded from copyright protection under the concept of merger as granting monopoly to these factors could be detrimental to innovation. Elements 'required by factors external to the program itself'-upon which the opinion elaborates are to be excluded under the concept of *scenes a faire*. Finally, elements 'taken from the public domain' are not protected because they are not original works.[38]

After this process, the court evolves what can be ideally referred to as the 'core' of protection and here the court delves into the question of substantial similarity between the protectable elements of two programs. This is the comparison stage, at which the decision-maker determines whether any copying constitutes infringement. The *Altai* test has not been wholly accepted by any Indian court. In foreign jurisdictions also, it has been critiqued for being under-protective as it filters way too many elements and fails to grant sufficient protection. However, it must be understood that in the absence of a concrete test which examines two programs in an elaborate manner, *Altai* test fills the void. The ever-expanding judicial challenge of balancing the interests remains unmet.

Having discussed the various tests enunciated by the courts to deal with the protectability of non-literal elements, we are of the view that the abstraction – filtration – comparison test AFC test comes closest to being a comprehensive test to check the violation of copyright protection. However, the test is not just a legal test, but also a technical test that requires a sound understanding of programming for its due application. Therefore, a word of caution has to be sounded to the courts because the AFC test, being a three-step process, could lead to a case of over protection or under protection if not applied in a precise manner.

The Indian approach and appurtenant legal concerns

As far as Indian jurisprudence on the subject is concerned, we still tend to compare two subject matters on the basis of overall impression on the third persons, which could be a good test for comparing two videos or images but certainly not for comparing two computer

[38] *Velasco Julian*, *supra* note 6.

programs. The most commonly followed authority on the subject is *R.G. Anand,*[39]wherein the court delved into the question of copyright violation of two video films. It is understandable that a comparison of two video films or pictures or any visible media could be undertaken on the basis of the 'look and feel' test, however, extension of the same to software programs could lead to abhorrent consequences as two computer programs, as already discussed above in the three prominent tests followed in global jurisdictions, need to be dissected so as to analyse the exact subject matter of protection. The major line of thought adopted by the court in *R.G. Anand* was taken from a catena of previous cases wherein the whole outlook of the court was targetedtowards the examination of colourful imitations. In a previous case of *C. Cunniah and Co.* v. *Balraj* and*Co.*[40] the court, applying the test of resemblance, had observed as follows:

> Applying this test, the degree of resemblance between the two pictures, which is to be judged by the eye, must be such that the person looking at the respondents' picture must get the suggestion that it is the appellant's picture. In this sense, the points of similarity or dissimilarity in the picture assume some importance.

In continuity with the same line of thought, in the case of *K. R. VenugopalanSarma*v. *Sangu Ganesan,*[41]the court again recognised and applied the test of overall reception of two competing expressions to the eyes of the observer:

> Applying this test, the degree of resemblance between the two pictures, which is to be judged by the eye, must be such that the person looking at the respondents' pictures must get the suggestion that it is the appellant's picture. One picture can be said to be a copy of another picture only if a substantial part of the former picture finds place in the reproduction

Pathak J., in *R.G. Anand*, attempted to dig deeper into the competing expressions and tried to analyse the scripts of the two video films, in the following words:[42]

> It appears from a comparison of the script of the stage play "Hum Hindustani" and the script of the film "New Delhi" that the authors of the film script have been influenced to a degree by the salient features of the plot set forth in the play script. There can be. little doubt from the evidence that the authors of the film script were

[39]*R.G Anand*, *supra* note 11.
[40]AIR 1961 Mad 111.
[41]1972 Cr. L.J. 1098 (Madras), at para 8.
[42]*R.G. Anand*, *supra* note 11 at para 66.

aware of the scheme of the play. But on the other hand, the story portrayed by the film travels beyond the plot delineated in the play.

The above analysis finds resemblance in the 'abstraction test' deployed in the *Altai* case which also involved the process of breaking into a program. Drawing a cue from this approach adopted by Pathak J., it can be suggested that Indian jurisprudence in this area need not be restricted to the look and feel test[43] and can afford to venture into interiors of the copyrightableobject by lifting the veil of external features. Thus, the current state of law in India as regards the concerns raised by the authors is a state of virtual '*non-liquet*' or the absence of law.

IV Rise of artificial intelligence and concerns

India is at the brink of an Artificial Intelligence *(hereinafter referred to as 'AI')* revolution. As per the latest NITI Aayog report,[44]the government has been recommended five sectors to examine the possible uses of AI, including health, education and transport. Whereas this development is welcome in a growing economy striving for manufacturing, it raises legal concerns, particularly with respect to the subject matter of this paper itself. As per Britannica, AI is the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. The term is frequently applied to the project of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience.[45]

In simple words, we are importing a technology that will act as a possible substitute for human intelligence and intellect. As a natural corollary to this, this technology will not only 'create' and 'invent' subject matters covered appropriately under the umbrella of intellectual property but also 'infringe' the rights belonging to others. Let us discuss the legal concerns and possible solutions in the subsequent sections. For the sake of brevity of this paper, the authors have consciously restricted themselves to issues pertaining to copyrights.

[43]*Raja Pocket Books* v. *Radha Pocket Books*, 1997 (40) DRJ 791 (Del).
[44]NITI Aayog, "National Strategy for Artificial Intelligence"(June, 2018), *available at:*<https://niti.gov.in/national-strategy-artificial-intelligence> (last visited on Nov. 25, 2019).
[45]B.J. Copeland (ed.), *Encyclopaedia Britannica* (Encyclopaedia Britannica Inc., Chicago, 1998), *available at:* <https://www.britannica.com/technology/artificial-intelligence> (Last visited on Nov. 25 2019).

Ownership of right of AI program

The first and foremost concern is- who will be called as the author of copyright*?*
On a preliminary examination, section 2(d) of the Act comes ahead to answer this question and states, "(vi) in relation to any literary, dramatic, musical or artistic work which is computer-generated, the person who causes the work to be created;".

However, the provision in its current shape falls short of addressing any scenario in which there is no 'person' involved who causes the work to be created. For example, recently, AI has been used to generate dramatic and creative works in music, journalism etc. One may say that they are free from copyright as they are not created by a human author as per the definition of copyright laws. Hence, such creations can be used and reused freely. But from the companies' and corporations' perspectives, it is bad news as they have invested millions of dollars in the development of systems that generate music. Speaking on the Future of Music, Dani Deahl addresses the concern thus:[46]

> Using AI as a tool to make music or aid musicians has been in practice for quite some time. In the '90s, David Bowie helped develop an app called the Verbasizer, which took literary source material and randomly reordered the words to create new combinations that could be used as lyrics. In 2016, researchers at Sony used software called Flow Machines to create a melody in the style of The Beatles. This material was then turned over to human composer Benoît Carré and developed into a fully produced pop song called "Daddy's Car." (Flow Machines was also used to help create an entire album's worth of music under the name SKYGGE, which is Danish for "shadow.") On a consumer level, the technology is already integrated with popular music-making programs like Logic, a piece of software that is used by musicians around the world, and it can auto-populate unique drum patterns with the help of AI.

More specifically, in AI operated computer programs or softwares, human intervention is not essential and there are duly operable programs that operate without any human intervention. Therefore, if there is no person who causes the work to be created, would law be according authorship rights to a computer program or the principal who owns the particular program?

[46]Dani Deahl, "How AI-Generated Music Is Changing the Way Hits Are Made" *The Verge, available at:* https://www.theverge.com/2018/8/31/17777008/artificial-intelligence-taryn-southern-amper-music (last visited on Jan. 22, 2020).

The Court of Justice of the European Union (CJEU), in its landmark decision called *Infopaq* decision (*Infopaq International A/S* v. *Danske DagbaldesForening*[47]) ruled that copyright can be claimed and applied only to the work in the original nature. Additionally, the originality must come from the 'author's own intellectual creation'. While interpreting, it is considered that a nature of original work must reflect the author's personality, which in clearer terms means that a human author is required, important and necessary for a copyright to be given to the generated work.

Some of the countries such as Hong Kong (SAR), Ireland, New Zealand and the UK have also faced such questions and thought of giving the authorship to the Programmer. More specifically, UK Copyright law, in the section 9(3)[48] states that, *"*In the case of a literary, dramatic, musical or artistic work which is computer-generated, the author shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken."

In both the scenarios, the question of liability comes into the picture. If authorship vests in an AI program, then any violation either by or of the program would fall in a grey domain or *non-liquet*, as mentioned by the authors before. This situation is not contemplated under section 17 of the Act either, which talks about the first owner of copyright and settles the question by merely projecting the author as the first owner. Moreover, if the law is amended to impute all rights and interests in the principal, then what would prevent the principal from challenging such an imputation as too remote in the eyes of law.

Ownership rights over data/creation generated by AI Program

AI is experience driven technology which accepts data initially and then generate that required output such as music, games, images *etc*. AI learns from the data and can also get the AI generated data as feedback to improve the intelligence of the AI programs and agents. For instance, regular feeding of information like location, food choices etc. to a program running over artificial intelligence would result into custom offers and program behaviour in line with the information fed by the user. Thus, the next issue in the copyright related issues in AI is -who shall be regarded as the owner or custodian of such information and if the information so fed is used through literal copying by some other computer program, who shall bear the responsibility for the same?

[47]European Court Reports, 2009 I-06569.
[48]The Copyright, Designs and Patents Act 1988, s. 9(3).

In terms of the laws, the focus would be on the person who makes necessary arrangements for the proper functioning of the program. The law, in its current shape, would look for the direct and immediately preceding human intervention in the process of infringement and would hold such person liable. However, this course of law would either result into under-protection, when such direct interventionist human would not be traced, or into over-protection, when such human had only played the peripheral role of operating the system and has no access to the data. Either way, the anomaly of law is glaring. More specifically, this is like asking whether liable would be put on the maker of a pen or the writer.

Take the case of apple pages software

Apple developed the Pages computer program and Pages is used to generate creative literature work and other text related output. Here Apple does not own the work, the copyrightability in every piece of work produced using that Pages software vests in the user of the Pages software, and not with the Apple. But this situation is ambiguous in case of AI program used for generation of creative and literary work and any other intelligent work output. In AI program, user input or the contribution to the creative and intelligent process may simply be to press a button to initiate the generation so that the machine can do its required work of creative and literary nature. There are many text generating programmes of such types. Stanford PhD scholar Andrej Karpathy taught an AI Program based on neural network reading of the text and composing the sentences in the same style which resembled the language of Shakespeare. In terms of copyright law perspectives, cases pronounced across various jurisdictions have solved the copyright issues on a case to case basis.[49]

In the famous case of *Nova Productions* v. *Mazooma Games,*[50] the Court of Appeal had the problem to decide on the authorship of a computer game, and court ruled that a player's input to the AI program "is not artistic in nature and he has contributed no skill or labour of an artistic kind". So, understanding the AI program, their working, creative and literature output or data from AI programs using user action could be considered on a case by case basis.

[49]Andrej Karpathy, "The Unreasonable Effectiveness of Recurrent Neural Networks", *available at:* http://karpathy.github.io/2015/05/21/rnn-effectiveness/ (last visited on Nov. 25 2019).
[50][2007] EWCA Civ. 219.

AI at whose risk?

Third issue in the list of concerns pertains to the extent of control that a creator can exercise over his own program. In normal computer programs, actions are performed when the operator requires them to be performed. However, in an AI, there is a direct correspondence between the third-party user and the system without any involvement of the principal or the creator. In such a scenario, an outcome of performance of such AI operated program cannot be a direct result of any command given by the principal. The extent of authorship and control and hence liability has to be adjudged on a case to case basis depending not only on the nature of the AI program, but also on the extent of intervention and involvement of various actors involved in the process. It is because of the nature of the program only that one can figure out the extent of human intervention needed. The more a program requires human intervention, the more it would tend to impute liability on the humans involved at subsequent stages. The level of AI transparency and human supervision should be the guiding factors. Specifically, when AI merely serves as part of a human-driven decision-making process, all the notions of human intent, motive, knowledge *etc.* work appropriately and in the same manner as a completely human driven action, but when AI behaves independently, the transparency of AI should be the first stage of examination, followed by the requirement of human intervention.[51]

Rules of first publication in India

Section 13[52] of the Act clearly require a work to be first published in India if protection is sought from the Act. Whereas computer programs are developed at all possible levels, the growth of AI at the municipal level is a long way to go. Therefore, most of the sectors in India, like health, education etc. are employing AI operated programs imported from foreign jurisdictions. Though AI based innovation has begun in the domestic space as well, the question of protection still looms large. With respect to such programs, what extent of protection, if at all any, could be offered by the copyright regime in India?

[51]Yavar Bathaee, "The Artificial Intelligence Black Box and the Failure of Intent and Causation" 31:2 *Harvard Journal of Law & Technology* (2018).
[52]The Copyright Act, 1957 (14 of 1957), s. 13. Works in which copyright subsists.

If section 13 comes in the way of imputing copyrightability in AI driven programs developed out of India, it would tantamount to a violation of India's global commitment[53] towards effective protection of copyright of foreign materials as well as of various reciprocity agreements.

Infringement of copyright

As contemplated in preceding sections of the paper, if an AI operated program can create, there is sufficient reason to believe that it can infringe too. Section 51[54] of the Act covers situations when a copyright could be said to be infringed and starts with the terminology 'any person'. An independent AI-run program neither falls under the definition of a biological person, nor under the definition of a legal person. The Indian law does not contemplate the possibility of any such entity, which assumes greater importance because it has now become an entity which is as good as a human in performing certain tasks and is fully capable for infringing a great deal of rights. If acts done by humans can be copyrightable or could entail trade secrets, there is nothing to prevent AI from performing the same tasks. In the light of these concerns, any act of infringement emanating from an independent computer program would be faced with an absolute paucity of remedies, thereby rendering the modern intellectual property regime in India as infructuous.

Efficiency concerns in AI-based computer programs

As per the tests of infringement amongst computer programs stated above, substantial similarity is seen as the basis of checking infringement, which can be determined on the basis of various tests. It is settled that as far as computer programs are concerned, purely efficiency driven elements are not protected as it could impede the progress and further creativity. In AI, the fundamental algorithm that forms the basis of AI-driven programs is same. In such case, what would form a part of the protectable core of a program? Could it be said that fundamental basis of AI, being the element essential for efficiency, could be rendered unprotectable as affording protection to it would lead to disastrous impact on further development?

[53]WIPO Copyright Treaty, 1996.
[54]The Copyright Act, 1957 (14 of 1957), s. 51. When copyright infringed.

V Conclusion

The advent of artificial intelligence in India is coinciding with an already existing void in the Indian IP regime with respect to the protection of computer programs. A complete imbalance and outdated nature of the tests enunciated for checking infringement in computer programs in India would pose grave concerns to the development of AI-driven products in India. In global commerce, a nation's ability to afford due legal protection followed by requisite remedies plays an integral role in the growth of commerce and entry of competitive players. Artificial Intelligence is making headway in the country but if it is not met with a competitive legal system and a level playing field in the domestic market, it can be counterproductive and may cause alarming harm to the employment scenario. It is this level-playing field that can be suitably created on the foundational basis of a strong copyright regime with well-defined contours of concerns ranging from protectability to infringement.

The advent of newer technologies such as Blockchain, Internet of Things (IoT) *etc*., raises a greater alarm and calls for immediate upgradation in the intellectual property regime. The authors are of the considered view that the definition of "author" in the Act is too narrow to deal with the situations when copyrightable work is produced solely through Artificial Intelligence because in that case no "person" could be deemed to cause the creation of work. This element of causation is the basic tenet of authorship, which goes missing when we talk about real AI innovation. The legislature needs to widen the scope of this definition and make way for such authorship to be vested, either in the creator of the AI run program or the licensee who is currently reaping the fruits of the AI because eventually, every artificial intelligence run program serves human beings in one way or the other and therefore, the liability cannot be imposed an artificial entity. The definition of "Indian work" also needs to be modified to provide space for foreign made AI programs which are producing their effects in India because restricting the functioning of artificial intelligence driven systems to a particular territory would lead to a loose protection.

It is also important to highlight that no particular test of infringement can be specified in a rigid manner because the innovation is a never-ending process and tests are always developed in the specific technological scenario. As of now, the abstraction-filtration-comparison test needs to be invoked by the courts so as to advance ahead from the look and feel test. Comparison between two computer programs is a complex process that needs to be undergone by dissecting the program, which can be successfully done using the AFC test.

Section 14[55] of the Act also requires modification so as to ensure that the copyright on all musical, artistic, literary and other works also extends to any imitation or reproduction of the work using AI based technologies, that is, in an indirect manner so as to cover instances wherein the imitations of the work are produced without any human intervention.

[55]The Copyright Act, 1957 (14 of 1957), s. 14. Meaning of Copyright.