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ROLE OF THE TEST OF ABSTRACTION, FILTRATION AND COMPARISON IN COMPUTER SOFTWARE INFRINGEMENT

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INTRODUCTION:

Computer Software is a collection of programs and related functionality. It consists of multiple programs, libraries and data. It usually developed by larger team. Its scope is broader encompassing various functionality and task. Its language is of high level programming language which is larger in size vary from Mbs to Gbs. It is pre-compiled and ready for execution. It consist of wide range of features and functionality. It is of more expensive and resource intensive to develop. It require advanced knowledge and expertise in software design. Software totally depend upon Operating system for its execution. In short, It provide platform for programme to run and manage task.

DEFINITION

The expression "software" has been defined as follows:

"Software is a set of instructions, known as code, that directs a computer to perform specified functions or operations. Thus, the software underlying a computer program that presents a user with the ability to select among number of different options must be written in such a way as to enable the computer to carry out the functions defined by those options when they are selected by the user. Therefore, although a user must activate the functions programmed into a piece of software by selecting those options, the user is only activating means that are already present in the underlying software. Otherwise, the user would be required to alter the code to enable the computer to carry out those functions."[1]

Software may be described as a programme or series of programmes, containing instructions for a computer either for the operational processes of the computer itself (operational; software) or for the accomplishment of other tasks (application software).

[1] Fantasy Sports Props, Inc. vs. Sportrslines.com, Inc, 287 F.3d 1108, (Fed. Cir. 2002)

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Computer software is described both as a programme in which the intellectual property rights (copyright) subsists and the medium on which it is embedded. The Supreme Court of Albama[2] (1996), the Court said, "Software is an arrangement of matter recorded in tangible medium and, therefore, constitutes a corporeal body":

Computer Software may be defined to mean a computer recorded on any disc, tape, perforated media or other information storage devise. The intellectual property rights in computer software is recognized and protected by the Copyright Act and as per the provisions of s. 14(b) of the said statute. The courts that have found that computer software to be tangible have based their decisions on the fact that the computer programme was coded in tangible medium, such as computer tape.[3]

LEGAL PROTECTION[4]

The computer programmes are protected by grant of copyright for such programmes. The international trend is tilting towards recognising more sophisticated computer programmes as inventions entitled to patent protection. Legal protection available both in copyright law and patent law.

The Indian Patents Act, 1970 does not recognise patent protection for computer programmes. The only mechanism of protection for computer programmes and computer data is under section 2(o) of the Copyright Act of 1957, which recognises computer programmes and computer data as creative work entitled to copyright protection.

COPYRIGHT

Section 2(ffc) defines computer programme as a set of instructions expressed in words, codes, schemes or any other form, including a machine readable medium capable of causing a computer to perform a particular task or achieve a particular result.

Computer programmes are considered to be literary works entitled to copyright protection. "Literary Work" includes computer programme and compilation including Computer Data

[2] Wal-Mart Stores, Inc. v. City of Mobile & County of Mobile, 200-622
[3] Citizens and Southern Systems Inc. v. South Carolina Tax Commissioner (1984) 280 SC 138 and refer Comptroller of the Treasury v. Equitable Trust Co. (1983) 296 Md. 459.
[4] page 65, Law relating to Intellectual Property, Dr.B.L.Wadhera.(fifth edition)

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bases.[5]

Section 2(o) definition literary work includes computer programmes, tables and compilations including computer databases. Hence, Copyright Law brought with intention to promote creativity and generate more original works for overall development of society and nation.

Software copyright protection is of fairly simple process. There is a duty of applicant to file with copies of source and object code in its programming language and machine readable format. It had been emphasized by the Rule 70(5) of Copyright Rules, 2013.

PATENT

Patentable subject must fulfil the following three criteria;

1. Novelty
2. Inventive step
3. Industrial application

But Software per se not protectable subject matter as per section 2(k) computer programme per se are not inventions itself.

REPORT OF JOINT COMMITTEE[6]

This report had elaborated the term 'per se' as follows:

"This change has been proposed because sometimes the computer programme may include certain other things, ancillary thereto or developed thereon. The intention here is not to reject them for grant of patent if they are inventions. However, the computer programmes as such are not intended to be granted patent."

Hence, the patent software protected as a invention when it has a *"technical effect"* and software with the *tangible element.*

The Indian law is based on the British law. Section 1(2) of the U.K.Patents Act of 1977 provides that the computer programme is not a patentable invention. Under the English system, in certain cases only, the computer programme can be patented along with the computer.

[5] Bharat Matrimony. Com.P., Ltd., Chennai v. People Interactive (I) Pvt. Ltd., Chennai, 2009 AIHC (NOC) 433(Mad).
[6] This Report presented to Rajya Sabha on 19th December, 2001.

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The Court held that a computer programmed to carry out a system to produce a required result is an apparatus modified or programmed to operate in a new way, which can be protected by a patent.[7]

The court[8] held a favourable opinion towards conferring patent for computer programme was expressed. It was held that a computer programmed to carry out a system to produce the required result is an apparatus modified. In this case, a computer programme capable of controlling computers and directing, modified or programmed to operate in a new way, can be protected by a patent.

COMPUTER ASSOCIATES INTERNATIONAL INC. VS ALTAI INC.

The approach of courts towards analysing the copying of the structure and other non-literal aspects of computer programs in the various jurisdictions of the United States appears to be converging around two essentially reductionistic approaches. Most attention has been paid to the approach adopted in *Computer Associates International Inc.* v *Altai Inc.*[9]

BACKGROUND OF THE CASE

Plaintiff copyrighted computer programme named **CA SCHEDULAR.** Defendant Altai had made computer programme OSCAR 3.4 infringing the said plaintiff's copyrighted work. District Court confirmed the infringement. At the same instance, the defendant's OSCAR 3.5 not substantially similar to the plaintiff's significant part called 'Adapter' which translator that help as machine readable in different operating system. This District Court held that the defendant made copyright infringement and awarded damages to the plaintiff. The both the parties appealed to appellate court (Plaintiff appealed that Oscar 3.5 too committed infringement and Defendant appealed that OSCAR 3.4 doesn't commit any infringement) which confirmed the decision of the district court. Then the Superior Court came up with these AFC Test which discussed hereafter.

It is necessary to briefly review the legal developments leading to that case.

The basic problems under consideration in the cases leading to Altai are the problems of applying copyright to the protection of structure of a computer program namely:

[7]IBM Corporation's Application (1980 FSR 564)
[8] Borough's Corporation Application (1974 RPC 147 (160)).
[9] Computer Associates International Inc. v. Altai Inc., 22 (1992) 23 IPR 385

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(a) to what extent should the structure of computer programs be protected by copyright, given the close connection between the structure and the functionality of the program?

(b) What is the appropriate analysis to determine if infringement has taken place?

These two questions were not actually identified separately in any of the cases under consideration, but were dealt with together as part of the larger question of determining whether there was **'substantial similarity'** between works which were the subject of a claim for infringement by non-literal copying. The infringement claimed in these cases was essentially copying of the structure of the program rather than of the literal text of the program code, and the courts dealt with these claims by adapting the analysis typically used for determining infringement by non-literal copying of traditional literary works. This involved asking whether the allegedly infringing and the allegedly infringed works were 'substantially similar'. A finding of 'substantial similarity' between the works is generally determinative of infringement.

IDEA AND EXPRESSION

US courts determine whether non-literal similarities between traditional works (such as similarities between the plots novels) are 'substantial' by attempting to distinguish the 'idea' of the work from its 'expression'; a very general description of the work is its 'idea', while the literal text and perhaps a detailed outline of the plot is 'expression'. Similarity of 'ideas' alone is never 'substantial' and will never amount to infringement while similarity of expression may be 'substantial' and thus may lead to a finding of infringement. The distinction between 'idea' and 'expression' to denote protectability by copyright is not peculiar to US copyright law, but it is cited much more readily in judgments of the US courts as a basis for decision because it is specifically provided for by statute[10].

This approach of distinguishing idea from expression was applied to the analysis of substantial similarity between computer programs by the US Court of Appeals for the Third Circuit in *Whelan Associates Inc.* v *Jaslow Dental Laboratory Inc.*[11] The test for distinguishing unprotectable idea from protectable expression in computer programs was a simple and elegant one:

[10] SECTION 102(b) of Copyright Act (Title 17 USC) provides: In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work.
[11] 1987 FSR 1

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> *The purpose or function of a utilitarian work [like a computer program] 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.*

The test was immediately and rightly criticised as being overly simplistic and based on misunderstanding of how computer programs worked. It was not adopted by some cases prior to *Altai* but it was only in *Altai* that a serious attempt was made to formulate an alternative test which took particular account of the special characteristics of computer programs. The decision in *Altai* will already be familiar to many but its importance requires a brief explanation of the test propounded in that case.

The recommended analysis of substantial similarity occurs in three steps, called 'Abstraction', 'Filtration' and 'Comparison'.

ABSTRACTION:

1. The **'Abstraction'** stage calls upon the trier of fact to analyse the program and identify the layers of abstraction within it. At the risk of oversimplification, one may see this exercise as requiring the identification of the layers of a structure in the program; the text of the program is the 'lowest' level of abstraction, a description of the code is the next higher level, a description of the major components of that description is the next, and so on up to the basic statement of what the program does, which is the 'highest' level of abstraction.
2. Judge Walker, who delivered the judgment of the Court of Appeals in *Altai*, described this exercise as the reversal of the normal process of writing a computer program, which typically begins with the computer programmer considering what the program is to do, then breaking down the identified task into a logical sequence of sub-tasks which are then further broken down into smaller and smaller sub-tasks until all these resultant sub-tasks are of the type which the computer is capable of performing. The final step is the writing of code to implement the detailed structure that has been worked out.
3. It is perhaps an implicit part of this 'abstraction' stage that the behavioural structure of the program would also be identified, but this could be easily overlooked in the judge's description of the test.

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4. This stage essentially involves the recognition that 'structure' of a computer program is too complex to consist of only one 'idea', as the *Whelan* test assumed. Structure can be identified at a number of levels of abstraction, from a general statement of the major functional aspects of the program to a very detailed description of all the individual instructions or groups of instructions making up the program.
5. If one examines the test as a whole, the value of having an 'abstraction' stage is essentially to remind the trier of fact that the structure of a computer program is so complex, existing as it does at a number of levels of abstraction, that the idea/expression dichotomy is meaningless unless one considers each level of abstraction in isolation. The 'idea' of a module becomes 'expression' when it falls to be considered at the next higher level of abstraction (which would tend to be a description of those lower level modules by their 'ideas').
6. *As a prescription, this stage suggests that the trier of fact must acquaint himself with not only the literal text of the program code but also consider each and every level of structure from the most detailed to the most general.*
7. Judge Walker, who deliver the opinion of the Court in Altai, suggest that this step is **'Conceptual'** while the next step, filtration is **'concrete'.**
8. As an anatomical guide to this procedure, the following description is useful:

   "At the lowest level of abstraction, a computer program may be thought of in its entirety as a set of individual instructions organised into a hierarchy of modules. At a higher level of abstraction, the instructions in the lowest level modules may be replaced conceptually by the functions of those modules. At progressively higher levels of abstraction, the function of the higher-level modules conceptually replaces the implementation of those modules until, finally, one is left with nothing but the ultimate function of the program. A program has structure at every level of abstraction at which it is viewed. At low levels of abstraction, a program's structure may be quite complex; at the highest level it is trivial."

9. The basis for this exclusion is that copyright does not protect an expression where it is essentially the only one way of expressing the idea i.e. where the expression has "merged" with the idea itself. The so-called **"merger doctrine"** in copyright that has been accepted by earlier American courts. For example, in *Lotus Development Corporation* v. *Paperback software International, supra,* note 36, Keeton J concluded that the plaintiffs' decision to use the "/" key in their Lotus 1-2-3 electronic spreadsheet

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program as the function key to call up the menu of the program, was not protectable under copyright principles, even though it was an expressive element, because there was no other logical choice given the constraints in the layout of the keyboard. In other words, "this expression merges with the idea of having a readily available method of invoking the menu command system" (a t p. 62,278).

10. Examples of such factors are set out in p. 494 of the Computer *Associates* case, *supra*, note 41: (a) the mechanical specifications of the computer on which the particular program is intended to run, (b) compatibility requirements of other programs with which the particular program is designed to operate in conjunction, (c) computer manufacturers design standards, (d) demands of the industry being serviced, and (e) widely accepted programming practices within the computer industry.

FILTRATION

Once the layers of structure in the allegedly infringed program have been identified, **'filtration'** occurs; the trier of fact must examine the individual elements of the program at each level of abstraction to see whether, taken in isolation, they are eligible for copyright protection or not. Elements which are unprotectable are filtered out leaving behind a 'core of protected material'[12]. The unprotectable elements to be filtered out are those which are:

'idea', or [expression] 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…

Space prevents detailed discussion of what these classes of unprotectable expression entail and why they should be filtered out[13]. It is, however, worth pointing out that the court's explanation of the category *'expression dictated by considerations of efficiency*, so as to be necessarily incidental to that idea' is significant in that it deals with the problem of 'merger' of function with expression which is especially problematic for copyright in computer programs. The existence of this factor in the *Altai* test recognises that efficiency is a serious constraint on the computer programmer's expression. The *Altai* court also recognised that the doctrine of merger applied to individual elements within the program and was not limited to the overall 'structure'.

[12] Judge Walker had adopted this phrase from MB.Nimmer & D.Nimmer and Nimmer on copyright, Vol 3 13-72 (1991)
[13] page 401 to 403 of Computer Associate case

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Finally, nowhere has the situation to filter certain elements being suggested in any of the above precedents except by some reading of *R.G. Anand*. The filtration is the most important of all measures to ensure adequate protection to computer programs. However, the subsequent cases (i.e. after *R.G. Anand*) examined in this paper show no direction towards finding out elements to be discerned. Hence, what is realized after detailed examination of the above is that the high court case analogies are not suitable in the light of program complexities. The major cause for concern is that the idea-expression dichotomy has largely remained unchallenged in India, which would have clarified the *R.G. Anand* rationale by the Supreme Court itself. Moreover, there is no case coming from the high court in which the abstraction stage has been explicitly applied. The 'look and feel' approach, which is tacitly applied in major decisions, seems to overshadow. In such a situation one is afraid that the *Altai* rationality of AFC is difficult to be candidly acknowledged considering the habitual hangover in these decisions detecting non-literal infringement in other class of works and also because of the problems caused by erroneously applying *R.G. Anand*. However, considering the fact that the idea-expression has deeper roots in the Indian copyright scheme unlike in the UK, there may be little resistance for the application of the *Altai* test if *R.G. Anand* is approved as discussed above. It is more so because it remains "the test" for having an advantage of being more organized, detailed and comprehensive than the other tests for delineating the protectable elements in a computer program.

COMPARISON

The final step in this analysis is **'comparison'** of the core of protected material left after filtration with the allegedly infringing program. The aim of this exercise is to determine whether the alleged infringer copied any protected expression, and to assess the 'substantiality' of that copied expression. If a substantial part of the protected expression has been copied, then infringement is established.

AFC TEST IN BRIEF

1. This 3-part test was designed to determine if the copyright in a computer program has been infringed, by the following stages:

   STAGE 1: **Abstraction** — Break down the computer program into its various structural layers.[14]

[14] page 490-493 of Computer Associate case

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STAGE 2: **Filtration**— Subject each layer to a filtration process to determine if it is an idea or an expression. All ideas are sieved out, as well as expressions which are:

(a) dictated by considerations of efficiency, so as to be necessarily incidental to an idea;[15]

(b) dictated by factors external to the program itself;[16] or

(c) taken from the public domain; so that what remains (if anything) is the "core of protectable expression" or the "golden nugget".[17]

STAGE 3: **Comparison** — Examine the portion copied by the defendent to determine if it is substantially similar to the "golden nugget". If so, the copyright in the computer program has been infringed by the defendent.

2. This 3-part test was recently adopted by an English court in *John Richardson Computer's Ltd* v. *Flanders and Chemtec Ltd*.[18] The plaintiff's program was a pharmacist's labelling system for use in a BBC micro-computer. The first defendent had been employed by the plaintiff to improve and maintain the plaintiffs' program. After leaving the plaintiff's employment, the first defendent modified the plaintiff's program so that it could be used on an IBM-compatible computer. The modified version was called the "Chemtec" program in the action for copyright infringement, the plaintiff conceded that no substantial part in the source code of its program had been copied the Chemtec program. Rather, the plaintiff's complaint was that the first defendent had taken the "general scheme of the [plaintiff's] BBC program, including the detail of certain routines an idiosyncratic nature". The plaintiff's case was therefore that the defendent had copied, not the literal elements, but the "non-literal" elements of the plaintiff's program. The main issue before Ferris J was whether the Chemtec program was substantially similar to the plaintiffs' program. This required a determination of whether the "non-literal" elements allegedly copied by the first defendent constituted idea or expression, for there can be no liability for copying "non-literal" elements of the program which are ideas. After a review of the American cases on the extent of copyright protection to be granted to "non-literal" elements in a computer program, as well as English cases, Ferris J concluded that:

> *'There is…nothing in any English decision which conflicts with the general approach adopted in the computer Associates case. I think that*

[15] That expression is not protected when it is only one way of expressing.
[16] page 494 of Computer Associate case
[17] page 495 of Computer Associate case
[18] (1993) F.S.R. 497

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> *in preference to seeking the "core of protectable expression" in the plaintiff's program an English court will first decide whether the plaintiff's program as a whole is entitled to copyright and then decide whether any similarity attributable to copying which is found in the defendent's program amounts to a substantial part of the plaintiff's program…But at the stage at which the substantiality of any copying falls to be assessed in an English case the question which has to be answered, in relation to the originality of the plaintiff's program and the separation of an idea from its expression, is essentially the same question as the United States court was addressing in computer Associates, in my judgment it would be right to adopt a similar approach.'*

It is submitted that the "abstraction-filtration" stages will be applied by English courts to determine whether a program created by the reverse engineer is "substantially similar in expression" to the program decompiled for the purposes of s 50B. The reverse engineer should find these two stages useful in determining if a particular interface feature in the decompiled program is part of its expression or only its idea. If it is an idea, he can use it with impunity in creating his own program. If it is an expression, he is not allowed to use it in creating his own program if it constitutes a substantial part of the decompiled program's expression.

The perimeters within which the reverse engineer can legitimately decompile a computer program in the UK are now defined by s 50B of the Copyright, Designs & Patents Act 1988. To ensure that software producers do not attempt to evade the operation of s 50B by contractual means via their licensing agreements, a new s 296A (1)(b), also introduced by the Regulations, provides that any term in an agreement which purports to prohibit or restrict the decompiling of a computer program where the conditions in s 50B are met, shall be void.

CONCLUSION

In Associates International, Inc. v. *Altai, Inc.*, the second circuit court came up with the popular 'Altai test' or AFC test which accepted those non-literal elements of computer software are protectable under copyright law. However, the court rejected the Whelan approach[19] as

[19] concludes that the computer programme's purpose is only unprotectable idea and rest is expression is considered to be descriptively inadequate and flawed understanding of programme method of operation.

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simplistic and conceptually overboard, and then it creates its own abstraction-filtration-comparison AFC test'. It begins with abstraction, the court first breakdown the allegedly infringed program into its constituent structural part. Then, filters out those elements that are not copyrightable, and last, would be to compare this material with the structure of an allegedly infringing program. This test is the most advance and widely follow test as far as the protection of non-literal elements of software is concerned.

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