IP PROTECTION FOR COMPUTER SOFTWARE : A CASE STUDY OF INDIA

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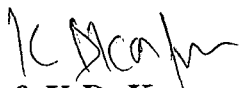School of International Studies
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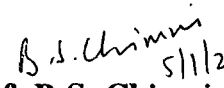Tel. 6107676 Ext.2338
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CERTIFICATE

This is to certify that the dissertation entitled "*IP Protection for Computer Software: A Case Study of India*", submitted by **Gopakumar K M** is in partial fulfilment of requirement for the degree of **Master of Philosophy** of this University. It is his original work and may be placed before the examiners for evaluation. This dissertation has not been submitted for the award of any other degree of this University or of any other University.

Prof. K.D. Kapoor
Chairperson

Prof. B.S. Chimni
Supervisor

For

The ingenuity of the hackers,
may your tribe increase !

CONTENTS

LIST OF ABBREVIATIONS

AIR	-	All India Report
BCD	-	Binary Code Decimal
CCPA	-	Court of Customs and Patents Appeal
CONTU	-	National Commission on New Technological Use of Computer Works
CPU	-	Central Processing Unit
EC	-	European Commission
EU	-	European Union
GUI	-	Graphical User Interface
IBM	-	International Business Machine
IDC	-	International Data Corporation
IP	-	Intellectual Property
IPRs	-	Intellectual Property Rights
MNCs	-	Multinational Corporations
PC	-	Personal Computer
PTO	-	Patent and Trademark Office
R&D	-	Research and Development
ROM	-	Read Only Memory
SSO	-	Structure, Sequence and Organisation

TRIPS	-	Trade Related Intellectual Property Rights
Ucc	-	Universal Commercial Code.
UCC	-	Universal Copyright Convention
UNCTAD	-	United Nations Commission on Trade and Development
UNESCO	-	United Nations Educational Scientific and Cultural Organisation
US	-	United States
USPTO	-	United States Patent and Trademark Office
USTR	-	United States Trade Representative
UTSA	-	Uniform Trade Secret Act
WIPO	-	World Intellectual Property Organisation
WTO	-	World Trade Organisation

LIST OF CASE LAWS

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CHAPTER-I

Introduction

CHAPTER I

INTRODUCTION

The software industry is increasingly becoming a key player in the domain of information technology.[1] The developments in the computing technology have resulted not only in the introduction of new class of machinery (computers) but also facilitated the development of a new industry.[2] Subsequently, the software industry has come to have an independent existence and it has surpassed hardware as the key to the success of computer based systems.[3]

SOFTWARE

In simple words computer software means a set of instructions that control a computer and induces it to perform certain functions or accomplish certain tasks. (However, this software-hardware distinction is technologically very diffuse in that the functions are mutually exchangeable). The term also includes the documentation for the preparation of set of instructions such as specifications, flow charts, user guides and monopoly. Even the output produced by running a computer program such as screen displays, data files etc also come within the meaning of software. A software can be written in a human readable language. But computers, as of today, cannot read the human readable language. Instead, it reads the program in a machine readable form. This machine readable language is binary i.e. a combination of 0 and 1. Therefore, one has to translate the program written

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[1]   "Information Technology (IT) covers all activities and technologies that involve the handling of information by electronic means: that is information acquisition, storage, retrieval, processing and control of information". It mainly concentrates in education, research, telecommunications, broadcasting, printing, publishing, computer and software industry. Nagy Hanna "Exploiting Information Technology for Development", *World Bank Discussion Paper, No. 246*, Washington DC, 1994, p. 1.

[2]   Thierry Noyelle, "Computer Software and Computer Services in Five Asian Countries", in *Services in Asia and Pacific,* Selected Papers, UNCTAD-UNDP, 1990, p. 77.

[3]   Ibid.

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in a computer language into a machine readable forms. This process of translating a program into machine readable form is called compilation.

In the early days of computer programming there was no standard programming methods. It was perceived as an act of creativity rather than as a technology. By the late 60's, a discipline called software engineering had emerged. It encapsulated the establishment and use of sound engineering principles to develop reliable and effective software. As a result, scientific techniques and sets of rules were developed for software development.

There are different models of software development.[4] The following are the general steps involving in software development:[5]

Requirement Phase

Specification Phase

Designing Phase

Implementation Phase

Testing Phase.

The success of a software development process depends on the following factors:[6]

1.   ability to meet time schedules,

2.   working within the budgeted costs,

3.   user-friendliness and flexibility of operations,

4.   quality and reliability,

5.   efficiency of operations.

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[4]   The main models are Water Fall Model, Prototyping, Spiral Model and 4th Generation Technology, See Infra note 25, p. 197.

[5]   Rajeev Benjwal, India's Computer Software Industry: An Assessment, M.Phil Dissertation Submitted to JNU, 1998, pp. 12-13.

[6]   Report of the Study Team On Computer Software for the 8th Five year plan for Electronic Industry, Electronics-Information and Planning, Nov.-Dec. 1989, p. 180

TYPES OF SOFTWARE

Software can be broadly classified as system software/operating software (those that interact with the machine e.g.: M.S., Dos, Windows), package s/w (those software which performs a series of functions to solve a practical problem) and custom built s/w (those developed to solve the problems of a particular customer eg: billing solutions).

Unlike the other manufacturing industry goods, software does not fall under the category of tangible goods. It is a logical theory and not a physical system element. Further, software is developed or engineered and not manufactured. Its development process requires skilled labour and human capital. Therefore, even a country with a small market will find it viable to produce software and export it to the world market.[7] Moreover, the cost of reproduction of software is minimal and it can be done very easily.

SOFTWARE INDUSTRY

The establishment of the independent software industry goes back to the late 60's when the IBM decided to unbundle the price of software from its hardware as a result of the anti-competitive procedures initiated by the U.S. Justice Department.[8] The software market is primarily concentrated in the developed countries.[9] The U.S. has the dominant share in the software market as well as in the production of software.[10]

Software is a product which has strong network externalities which prompt the industries to establish *de facto* standards. This is done in order to check competition and to establish a market monopoly. After the establishment of such a

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[7]   Supra note 6.

[8]   Supra note 2, p. 80.

[9]   The developed countries viz USA, Japan, UK, Germany, France and Italy together have 73% of market share of the world wide software market, see infra note 24.

[10]   US has a 46 % share in the world package software industry market and among world's top ten companies 6 are from the USA. See US Trade Representative, US Industry and Trade Outlook, 1998, Chapter 28, p. 1.

monopoly by using their dominant position the industry forced the hardware manufacturers to avoid the competing products.[11] For instance, Microsoft bundle Internet Explorer with Windows 98 so as to capture the internet browser market.[12] Further, Microsoft allegedly threatened to quash the innovation by not contracting to provide Macintosh products, if Apple continued to develop a competing product.[13] Another practice of Microsoft was the providing of the Windows operating system with preloaded packages at a 60 per cent discount. This cut the market share of other competing package products.[14] It should be realised that the market of a software is too short - 1 to 3 years.[15] In this light, a program's success depends on such marketing strategies and also the compatibility of the program with earlier programs.

The unique features of the software industry that includes labour intensive skills and relatively low capital requirements favor the developing countries to expand and strengthen their software industries both domestically and internationally.[16] The non proprietary nature of technology also helps the developing countries to catch up with the technological developments ensuing in the west.[17] However, the presence of the developing countries in the global market is confined to only low value products. Their role in the mass marketing packages or in the operating systems market are nil. For instance, in the operating system market, Microsoft controls 90 per cent of the market share.[18] Also, the speed of growth of the software industry will create a situation where "the countries

[11]   Stephen Tolbert, "Antitrust Regulations and the Computer Industry: Perspectives on the High Technology Sector through Analysis of the Microsoft Case", *W.Va. Journal of Law and Technology*, Vol. 3, 1999 downloaded from http://www.wvgolt.edu/v312/
[12]   Ibid.
[13]   Brenton Schlender and David Krickpatrick, "The Valley V Microsoft", *Fortune*, March 20, 1995, p. 84.
[14]   Steve Haman and Susan Garland, "Justice V Microsoft What's the Big Deal?" *Business Week*, Dec. 1, 1997, p. 159.
[15]   Jery Useen, "Forget Patents says Stanford Prof." *Inc.*, Oct. 1996, p. 23.
[16]   Carlos M.Correa, "Strategis for Software Exports from Developing Countries", *World Development*, Vol. 23, p. 179.
[17]   Ibid.
[18]   Supra note 11.

without a relatively active and up-to-date software sector will find it increasingly difficult to 'catch up' in terms of capital outlays, labor, skills, and the growing importance of technology changes, organisation and management in software production".[19]

INDIAN SOFTWARE INDUSTRY

The history of the Indian software industry goes back to 1966 when the Electronic Committee recommended an "an all-out effort not only to design and produce small and medium scale computers but also the components and subsystems".[20] This was followed by the establishment of the Department of Electronics in 1970 and the Computer Maintenance Corporation (CMC) to service state owned computers.[21] This quest for self reliance was further fuelled when the IBM brought in computers which had been discarded after use in the West and presented them as new. It even started charging heavy fees for the leasing and maintenance of these 'second hand computers'.[22] Further, the IBM refused to start domestic production and continued imports.[23] This resulted in the exit of the IBM from the Indian market. It was the human resource left behind by the IBM that formed the foundation of the Indian private software industry. The government announced its first software policy in 1984. It was followed by other steps like providing communication, infrastructural facilities and liberalizing the financial regulations etc. As result, the industry witnessed a tremendous growth.[24] However,

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[19]   Robert Schware, "Software Industry Entry Strategies for Developing Countries: A 'Walking on Two Legs' Proposition", *World Development*, Vol. 20. p. 143.

[20]   Quoted by, Stephen D. Mc Dowell, "The Decline of the License Raj: Indian Software Export Policies", *Journal of Communication*, Autumn 1995, p. 29.

[21]   Ibid.

[22]   Ibid., also see, Joseph M Grieco, "Between Dependency and Autonomy: India's Experience with the International Computer Industry", pp. 55-81, in Theodore H. Moran (ed.) Multinational Corporations: The Political Economy of FDI, Lexington Books, Massachusetts, 1989.

[23]   Hans-Peter Burner, Closing the Technology Gap-Technological Change in India's Computer Industry, Sage Publications, New Delhi, pp. 100-101.

[24]   In 1997-98 the Software Industry in India was worth Rs. 100.4 billion (US$2.7 billion) the Compound Annual Growth Rate (CAGR) the Indian Software Industry in the last five years had been 53.84% Source NASSCOM. "The Software Industry in India, A Strategic Review 1998-99". Downloaded from www.nasscom.com.

the emphasis of the Indian software industry was on the export market; using its highly skilled English speaking and fairly cheap labour to attract the custom built software market in the developed countries especially in the U.S.[25] This strategy, however, affected the development of the domestic market.[26] The Indian industry could not meet the needs of the domestic consumer especially in the software package market.[27] The emphasis on export also affected the development of mass market packages because of technological and financial shortages and also the inferior domestic marketing network.[28] Experts warn that India needs to pay more attention to domestic opportunities as these can have huge returns in terms of gaining experience and coming up with innovations in software productions, and also providing training that will allow the creations of a whole milieu of software experts.[29] The undue emphasis on export is regarded as the reason for the non-development of the domestic software market. What ensues is the problem of computer accessibility in the domestic sector. Computer programs are mainly in English, and its adaptation into local languages is necessary to increase the access and thus to create more opportunities in the market.[30] A depressing feature of the Indian software industry is its minimal presence in the value added products. To over come this, the industry needs a viable mechanism to disseminate the technology within the industry. The issue of zero tariff on imports from the year 2000 would result in a flooding of foreign imports into the Indian Software

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[25] India Contributes 16% of market share in customised services. R.C. Tripathi, S.S. Grover and A.K. Chakravati, "Computer Software and Intellectual Property Rights: Present Status and Future Direction", *Electronics Information and Planning*, Jan. 1998, p. 199.

[26] The CAGR of Export Software Industry for last five years has been 57.44% as against domestic industries' CAGR has been 48.26%, ibid.

[27] As Per NASSCOM Study, over 113 new Software Products were launched by domestic Software Companies in 1997-98. During the same period over 140 new software products were launched by oversees companies in the Indian domestic market, Supra note 25.

[28] Supra note 27, pp. 203-204.

[29] Supra note 20.

[30] Department of Electronics initiated such a program called 'Technology Development for Indian Languages Program' which includes development of tools for Machine Aided Translation Systems, Multi-Lingual Electronics Dictionaries, Speech Recognised/Synthesis etc. Another programme is called 'Tools and Technologies for Internet in Hindi', Govt. of India, Department of Electronics, *Annual Report 1998-99*, pp. 14-15.

market.[31] The above mentioned problems leads us to the issue of the intellectual property regime which has a major role in the development and protection of software related technologies.

STATEMENT OF THE PROBLEM

Unlike conventional industrial products, software can be copied very easily without much investment or skill. It is alleged that the industry loses US$11.2 billion every year due to piracy, which includes the illegal copying of software for retail sale or internal organisational use.[32] There are two solutions advocated by the software industry to tackle the problem of piracy namely, technological and legal. However, in the view of the industry, both these solutions have proved incapable of extending the level of protection required for the industry. The technological solutions can be bypassed by using an equally efficient technical skill. The legal solutions offered are mainly the attribution of proprietary rights to software products.[33] Firstly, such an approach challenges the traditional notions of IPRs. The dynamic nature, intangibility, and abstractness of software causes legal and practical difficulties for it to be fitted into the substantial qualifications of the IP protection. Secondly, it prevents other cost effective providers to enter into the market. Thirdly, such a solution has negative implications for consumer rights and public interest.

The eighties witnessed certain developments on the technological and legal fronts which altogether transformed the software industry. On the technological front, the introduction of the personal computer and the commercial success of software packages created a large and independent market for computer software. This vast market potential prompted the software developers to fall back on IPRs

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[31]   Glennon. J. Harrissionn, "The Information Technology Agreement", Congressional Research Service, The Library of Congress, April 25, 1997.

[32]   NASSCOM, The Software Industry in India: A Strategic Review, 1997-98, 1998, p. 82.

[33]   Rochelle Cooper Dreyfuss, "Information Products: A Challenge to Intellectual Property Theory", *New York University Journal of International Law and Politics*, Vol. 20, 1988, pp. 897-927.

to avoid competition. In 1980, the US extended copyright protection to computer software by amending its copyright act. India did the same in 1984. A second legal development was the decision of the US Supreme Court in 1981 in *Diamond V Diehr*[34] to grant process patent to a computer aided rubber curing process. This was followed by the changed attitude of the US Patent and Trade Mark Office in granting patents to the software related inventions. As a result, there was a sudden rush for patenting software and this led to the patenting of even those software development techniques which were already in the public domain. The industry, however, preferred patents to copyright because of the exclusive protection available under the former. This led to multiple IP protection for software products.

Summarily, it can be said that in the initial stages the IPRs played a limited role in the development of the software industry. They came on the scene only after the independent establishment of the industry. This indicates that IPRs are being used not for the purpose of stimulating inventions but as a shield to check competition. According to critics, the unique features of the computer software industry demands a light IP protection i.e. protection only against literal copying. Any policy contrary to this would retard the development of the software industry in the developing countries.

The debate on the IP protection for the computer software is very crucial for the developing counties as they are at the threshold of marketing software packages. These countries have to take much care while formulating their IP laws and policies pertaining to computer software. The moot question, however, is as to how much space is available to a developing country like India in formulating such laws and policies in the light of TRIPS, the Berne Convention, and the WIPO Copyright Treaty. All these issues are examined at some length in this dissertation.

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[34]   450 US 175 (1981).

SCOPE OF THE STUDY

The second chapter discusses the issues relating to software IP protection in the light of the developments in the US software IP regime. The third chapter discusses the nature and the scope of protection available in India. The fourth chapter analyses the compatibility of Indian IP laws for the protection of computer software with the international standards prescribed in the following international treaties viz; Paris Convention, Berne Convention, TRIPS, and WIPO Copyright Treaty. The fifth chapter contains the conclusions of the study.

CHAPTER-II

Intellectual Property Protection For Software: An Over View

CHAPTER II

INTELLECTUAL PROPERTY PROTECTION FOR SOFTWARE:
AN OVERVIEW

This chapter attempts to narrate the Intellectual Property issues involved in computer software. In doing so, it traces the developments in the US pertaining to software IP laws. The reasons for relying on the US laws are three fold:

1. The US stands as the pioneer in most of the technological advances that have been witnessed by the software industry;

2. The US controls the software market in a predominantly unilateral way;[1]

3. The US has effectively blocked other major global competitors from effecting a change in their domestic IP laws to benefit their respective software industries.[2]

The chapter is conceived in four parts. The first three sections discuss the issues involved in the different modes of IP software protections; namely, Copyright, Patent and Trade Secret. The fourth section is a purview of the implications of these developments for the developing countries.

I. COPYRIGHT

Copyright protection is the most common mode of protection for computer software.[3] The US was the first country to extend copyright protection for its computer programs. In 1964, the US copyright office announced that it would

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[1] USTR, *US Industry and Trade Outlook* 1998 pp.28-1-28-25, International Data Corporation (IDC) estimates that the US packaged software market, worth $50.4 billion in 1996 with a 46 percent share of the world total $ 109.3 billion. In 1996. Further out of this $ 109.3 billion market US vendors share is $7.70 billion. Among the world's top 10 software companies 6 are US companies.

[2] Joel West, "Software Rights and Japan's shift to an Information Society", *Asian Survey*, Vol 25, Dec. 1995, pp.-1118-1139. Also see infra note 9, pp.227-314.

[3] www.wto.org. there are 117 signatories to the TRIPS agreement which makes explicit provision for copyright protection of computer software.

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accept programmes for registration under the rule of doubt.[4] However, such a policy did not attract any considerable interest from the software industry.[5] (The reasons for this cold response are discussed elsewhere in this chapter). Nevertheless, this new development was a definite policy shift by the copyright office which hitherto gave protection only to tangible elements. The extension of this safety cover to include intangible elements like computer programs was in fact a novel deviation. It has to be understood that this change was inevitable in many ways. Till now, the software consisted mainly of custom built software targeting machine-specific usages. Hence, the protection could be given under licensing agreements where in the protection of codes ensured the products safety in the form of a trade secret.[6] However, with the arrival of software packages for mass marketing, this licensing norm proved ineffective as the vistas for mass copying made the codes extremely vulnerable.[7] Also, this policy change gave another option for software developers to seek effective protection.

Coming to the issue of the software industries cold shoulder to these changes, one encounters some specific reasons.[8] Firstly, there were no independent software industries, especially for operating systems and it was created and marketed by the hardware providers only. This brand specificity of the operating systems ruled out any hopes for a mass market. This in turn meant that the dangers of copying were improbable owing to its non-profitability. Hence, the new law was seen more as a vestige than an effective deterrent. Secondly, the application programs, due to their custom built nature, were tailored to suit individual needs. Here too the threat of copying was minimal. Thirdly, it can be

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[4]   Office of Technology Assessment, "Finding a Balance: Computer Software, Intellectual Property and the challenge of Technological Change", OTA-TCT-527, 1992, p.66. Also see Breyer, "The uneasy Case for Copyright: A Study of Copyright in Books, Photocopies and Computer Programs", *Harvard Law Review*, Vol-84, 1970, pp.338-350.

[5]   Ibid.

[6]   Supra note 4 p.82.

[7]   Dennis S Kargala, "The Relative Roles of Patent and Copyright in the protection of Computer Programs", *John Marshall Journal of Computer and Information Law*, Vol. 17, No-1, 1998, downloaded from www. Find law.com.

[8]   Supra note-5, p.344-345.

seen that the US software market of the 1960's was flooded with softwares that were sold along with service packages. Here too, copying was non-feasible as the duplicator would have to build up a substantial service infrastructure. Finally, the hesitance on the part of the software company was intensified by the nature of the protection norms which demanded the companies to deposit their source code for Trade Secret protection.[9] Since the protection was awarded under rule of doubt, there was no direct statutory protection. This meant that there was always a chance that the source code would become public without having been ensured as a Trade Secret.

The persistent efforts, that started in the 1970's,[10] to extend statutory protection to software resulted in the amendment of the Copyright Act in 1976. The new act did not explicitly refer to computer programmes, though the legislative history had clear references to it.[11] Infact, the legislature was waiting for the report of the National Commission on New Technological uses of Computer Works (CONTU) set up in 1974. The report, which came out in 1979, explicitly recommended the need to make statutory provisions to protect computer software as a literary work: "……. to make it explicit that computer programmes, to the extent that they embody an author's original creation, are proper subject matter of copyright".[12] The need for an amendment was further elaborated by urging the deletion of section 117 of the existing act so that the right to make back copies and adaptation could be given to the rightful processors of the copies.[13]

The Congress accepted the CONTU recommendation and enacted the Computer Software Protection Act in 1980 to provide statutory protection for computer software. It was classified as a literary work and was clearly defined in

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[9]   Jonathan Band and Masanofu Katoh, Interfaces on Trial: Intellectual Property and Interoperability in the Global software Industry, West View, Boulder, 1995, p.71.

[10]   Supra note 5 p.347.

[11]   Supra note 9.

[12]   Final Report of the National Commission on New Technological Uses of Copyright work 1 (1978) Quoted by Band and Kakoh supra note 9.

[13]   Supra note 4 p.67.

Section 101 of the Copyright Act: "Software is a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result".[14] The CONTU recommendations were not wholly welcomed by the legal commentators. It was attacked vigorously on various grounds.

1. The main critique was levelled against the use of the term 'literary work' as an analogue to 'software' in the Copyright Act. The argument discrediting this usage maintains that if software is a literary work, it should convey the expression to the user. But it is seen that most of the programmes distributed to the public is in object code (a machine readable program form in binary numbers i.e. 01 combinations). This means that unlike other literary works, the computer software, except user interface, does not reveal its expression to the consumer.[15] Also, the software differs from a literary work in that, the program accomplishes a task and produces a result.[16] It has also been argued that creative elements enhance the efficiency of a literary work but in the case of a computer program the onus on creativity decreases the efficiency ('efficiency' in terms of program speed).[17]

2. Unlike any other factual work (for eg., an instruction book), the object code in software never instructs the human user to perform a task. Instead, it works in conjunction with the hardware to perform the task. Therefore the economic value of a program in object code form lies not in the information it conveys to the human being but rather in the information it conveys to the machine.[18] This strips the software of a human value pertaining to literary works.

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[14] 17 USC 101.
[15] National Academy of Science, Intellectual Property Issues in Software, National Academy Press, 1991, P.25.
[16] S. Caran Daughtrey, "Reverse Engineering of Software for Interoperability and Analysis", *Vanderbilt Law Review,* Vol. 47, 1994, P.149.
[17] Ibid. 150.
[18] Pamela Samuelson, "CONTU Revisited: The Case Against Copyright Protection for Computer Programs in Machine-readable Form", *Duke Law Journal,* Vol-66 1984, p.727.

3.   Another debate revolves around transparency. Normally, a publicly distributed, copyrighted literary work conveys the ideas of the author in toto. In the case of computer software it becomes possible to publish the work and keep the basic ideas a secret, so as to increase its commercial value.[19] The user is familiar only with the performance scheme and not the program *per se*. The idea of giving copyright protection is to bring the new ideas into public domain as a *quid pro quo* to the limited monopoly by a few.

4.   Computer programs, in its source code form, are a set of instructions. But since it has a functionality (it performs utilitarian tasks) it is not the subject matter of copyright protection. This was pointed out by John Hersey's dissent note recorded in the minutes of the CONTU proceedings: ".....the program itself, in its nature and usable form is a machine-controlled element, a mechanical device, which on constitutional grounds and for reasons of social policy ought not be copyrighted ... admitting these devices to copyright would mark the first time copyright had ever covered a means of communication, not with human minds and senses, but with machines".[20] The argument given to counter this was that such a staunch stand was unnecessary since utility creations like maps and charts were given copyright protection.[21] It has to be understood that unlike maps and charts, the software not only gives the information but goes on to perform a function. Hence the need to withhold copyright.[22]

5.   Further, giving uniform protection under the head 'software' to all computer programs, irrespective of their functional specificities is problematic. Operating systems are quintessentially functional. Unlike the application programs which run in machines, these operating systems make

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[19]   Ibid 710.
[20]   CONTU Report p. 27-28, supra note 9.
[21]   Supra note 15, p.26.
[22]   Supra note 7.

the machine run. In other words, operating systems speak to machines rather than humans (at some level there is a human link in the case of application programs). This lack of a human agency disqualifies it from being a literary work where there is a definite human interaction. The value of the operating system lies not in its expression to the user but in its functional relevance in a machine.[23]

6.   Being classified as a literary work would entitle a program to a 76 year protection period under the Copyright Act. This coverage is unnecessary when one considers the fact that the real life cycle of a product in the software market is 1-2 years.[24] This unnecessary extension would create monopolies and block the public appropriation of the invention. It is clear here that the recommendation is insensitive to the current industrial realities and practices.

The amendment resulted in a floodgate of litigations challenging the scope of the copyright protection to software programs in machine-readable form, operating systems, macrocode etc. In *Apple Computer Inc. vs. Franklin Computer Corporation*[25], the court affirmed the protection to computer programmes in the above mentioned forms. In this case the defendant (*Franklin*) copied the plaintiff's popular operating system to make a competitive and compatible operating system. The court held that the definition of software includes programs in machine readable form. Moreover, according to Section 101, literary works include expression not only in words but also numbers or other numerical symbols or Indica[26]. This judgement cleared the prevalent doubts in these first generation cases about the literal copying of computer programs, irrespective of the forms. It definitely was declared as an infringement of copyright.

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[23]   Paul Goldstein, "Infringement of Copyright in Computer Programs", *University of Pittsburgh Law Review* vol. 47, 1986, pp.1126-27.

[24]   Peter.S. Menell, "Tailoring Legal Protection for Computer Software Programs", *Stanford Law Review* Vol-39, p.57, p.1571.

[25]   714 F2d 1240.

[26]   Supra note 4, p .68.

The late 1980s witnessed a series of cases alleging non-literal copying (copying parts of the program). The early judgements in these second generation cases extended protection to the non-literal elements of copying.[27] These blanket protections covered program and user interfaces, which were traditionally considered as the functional elements in a program. Their presence is necessary to achieve compatibility and interoperability. Therefore, such a protection resulted in a debate on compatibility and interoperability and reverse engineering.

THE COMPATIBILITY DEBATE

Compatibility in its general sense refers to a product's ability to work together with another product. Broadly, compatibility can be classified into vertical and horizontal[28] . A software is said to be vertically compatible when it does not perform the same function of an underlying program but can very well connect to it in a similar way. A programme is also said to be vertically compatible when one can send the outputs of the particular program as the input of another. When a program is able to run another programme or when one program can ask another to perform some functions, it also amounts to vertical compatibility. Such vertically compatible programs increase the market (as also the interoperability) of the original program.[29] When a program essentially performs the same functions of another program, it becomes horizontal compatibility. This helps the market competitors to develop competent parallel programs. However, these distinctions are material only in accordance with the perception that one has about copyright protection[30].

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27   In Whelan Associates Inc. v Jaslow Dental Laboratory Inc [(1987) FSR-1] court extended protection to the structure, sequence and organisation (SSO) of the program.

28   Garg R Lgnatin, Let the Hackers Hack: "Allowing the Reverse Engineering of Copyrighted computer programs to Achieve compatibility ",University of Pennsylvania Law Review vol.140, No.5, 1992, p.2003.

29   Ibid. p.2044-45

30   Ibid. p.2045.

The compatibility of the program lies in the interfaces[31]. If the output of the application is not permitted into the input of the operating system, then they are incompatible (due to the differing interfaces). Therefore, to make a compatible program one should know the interface of the other programs. The interfaces exist throughout the various stages of software use. They exist between the hardware elements (e.g. between main memory and CPU), between software and hardware elements (between operating system and CPU), between two software systems (between operating system and application program) and between the software and the user, known as user interface (eg. help menu).[32] The first three interfaces are essential to make a compatible program. The last one is important because a user would be reluctant to use a program with a non compatible user interface (user unfriendly) . Hence, compatibility includes both user and system compatibility. These would be discussed separately.

As stated above, to make a compatible program, one requires information on the interface specifications of other programs. If the interfaces are protected one cannot use it without the prior permission of the copyright owner. Any unauthorised manufacture of a compatible programme will result in a copyright violation. However, such restrictions, if used in bad taste can lead to ultra-protectionism.[33]. Such a move was opposed by a section of the industry, academicians and consumers.[34]

The justification for the protection of interface specifications emanates from the typical reason on which IP protection is based. That is, if one individual or corporation has invested time and resources to produce a creative work, he/they should be able to recover the invested amount through a limited period

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[31]   Supra note p.7
[32]   Ibid.
[33]   Supra note-9.
[34]   Anthony L. Clapes, Softwars: The Legal Battles For control of the global software industry, Quorum Books, Westport C., 1989. The book favors copyright protection for interface specifications and opposes reverse engineering.

monopoly.[35] But this argument has three innate fallacies (philosophical, factual, and legal): On philosophical grounds, it proposes that copyright protection is a matter of natural right. However, in reality, such a right is not a natural right but one based on social and economic benefit. Here, protection is not an end in itself but a means to an end.[36] The factual fallacy relates to the incentives which are seen as necessary to stimulate better innovations. But the problem here is that the quest, which is a stimulant in itself, is being ignored or rather seen here as a commodity[37]. The legal fallacy is that it presupposes the primary function of copyright as the protection of a creative expression whereas in reality copyright is a means to place the creative ideas in the public domain for the larger social benefit.[38]

Another argument is that non-protection of interfaces leads to standardisation that will ultimately tie the industry down to obsolete standards. A common example of such an occurrence is the design of QWERTY typewriter keyboards. The purpose of placing such a key was to avoid jamming while using frequently occurring letters(especially adjacent leters). Even though this problem had been solved by subsequent technological developments, still the same keyboard continues due to the network externalities (esp., the failure of other keyboards owing to user disinterest).[39] But in reality, standardisation takes place with or without IP protection. It is arbitrary and evolutionary in the sense that no person actually advocates or designates a particular standard.[40] It comes forth from the collective use that the model claims over a period of time.

[35]   Ben Shneiderman, "Protecting Rights in User Interface Designs", *ACMSIGCHI Bulletin,* October, 1990, downloaded from www.mcutlchan.com/IP.
[36]   Thomas M.S. "Three Common Fallacies in the User Intertace Copyright Debate", *The computer Lawyer*, Vol.7, number-2 Feb-1990. Downloaded from www.Leageforprogramingfreedom.org.
[37]   B.S Chimni, "The Philosophy of Patent: Strong Regime Unjustified", *Journal of Scientific and Industrial Research*, Vol. 52, 1993, p.234.
[38]   Supra note 36.
[39]   Supra note 28, pp.2027-28.
[40]   Ibid. 2033.

It is also opined that standardisation results in a less variety of products.[41] But, a free appropriation of interface specification, infact, increases the innovations and the availability of compatible products. By avoiding the reinvention of the wheel, compatibility allows the programmer to concentrate in improving program quality rather than replicating achievements. It allows the programmer to enter into a monopolised market to attach his single innovative component to an existing compatible system.[42] Thus, it increases the social benefit by restricting monopoly practices in the market.[43] Further, a legal protection provides the software developer a chance to adopt a non-compatible standard to successfully manipulate the presence of network externalities. By adopting a compatible standard, one can increase the network by introducing rival products. Therefore, each firm aims to establish particular standards which increases the social cost by unnecessary expenses on "reinventing the wheel".[44]

The strong presence of network externalities favours only one kind of inventions i.e. incremental inventions and not revolutionary inventions. The huge expense in training and infrastructural investment makes the companies wary of switching over to a new system within a short time-span.[45] Further, the history of software development also vindicates this: "The 'broad protection favors innovation' line of reasoning also makes a false assumption about the nature of development in the software industry. It assumes that important innovations in software interfaces are revolutionary and not evolutionary in nature. This is wrong. It is impossible to point to a single element of any current mass-market program's interface that did not have a progenitor in one or more prior programs.

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[41]   Ibid. 2029.
[42]   Ibid. 2030.
[43]   Peter. S. Menell, "An Analysis of the Scope of copyright protection for application programs", *Stanford Law Review* p.41.
[44]   Ibid. 1069.
[45]   Supra note 28, p.2030.

Software interfaces are means of communication between programs and their users. Like other languages, they evolve over time."[46]

Finally, the interfaces are not the proper subject matter of copyright protection. Interfaces are the communication means between the different components of the software and also the user. Therefore, they are functional in nature and not an expression. Section 102(b) excludes all functional elements. It reads, ".....in no case does copyright protection for an original work of authorship extend to an idea, procedure, process-system, method of operation, concept, principle or discovery regardless of the form in which it is discovered, explained, illustrated or embedded in such a work". Hence, any protection to the user interfaces is against the statutory provision.

In the absence of any express statutory provision, regarding the protection of interface specification, the courts decided the second generation cases by applying statutory (i.e. section 102(b)) and doctrinal limitations (i.e. doctrine of merger[47] and *senes-a-faire*[48])

Case Law: Apple Vs Franklin

Apple Vs Franklin[49] was the first case on compatibility. One of the arguments of the defendant to justify the literal copying of the plaintiff's object code on compatibility ground was that independent development of Apple compatible operating system was not feasible. But the court, without paying much attention, held that. "Franklin may wish to achieve total compatibility with independently developed application programmes for the Apple III. But, that is a

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[46]   Supra Note 36.

[47]   The Doctrine is based on a supreme court decision in Baker v Selden 101 US 99 (1979) In Baker V.Selden, [101 US 99(1879)] the Supreme Court held that plaintiff's copyright in a book describing a new system of accounting covered only its description of the system, not the system itself. In other words copyright protection extends only to the expression of an idea and not to the idea itself.

[48]   *Senes-a-faire* are incidents, characters or scenes from History which are a Practical necessity indispensable, or at least standard, in the treatment of a given topic.

[49]   714 F2d 1240.

commercial and competitive objective which does not enter into the some what metaphysical issue of whether particular ideas and expressions have merged".[50] Thus we see the court considering the merger issue as a metaphysical rather than pragmatic one.

Whelen Associates Inc Vs Jaslaw Dental Lab Inc.

Whelen Associates Inc Vs Jaslaw Dental Lab Inc[51] was the first case to explicitly extend copyright protection to the non-literal elements of a copy right program. In this case, the defendant (Dental Lab) hired the plaintiff to develop a software called Dentalab in EDL program language for a IBM computer. Later, the lab, independently developed a new program called Dentcong in the BASIC program language for the micro computers. Though the second programme was written in a different language for a different computer, the structure and sequence and even the outputs of the screen displays were the same. The District Court dismissed the petition. However, in the appeal to the Circuit Court, this decision was reversed after the court applied a test to decipher idea from expression, based on *Baker Vs Selden.*[52] The court held that regarding the idea-expression dichotomy, "...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,... the particular means chosen is not necessary to the desired purpose; hence, there is expression, not idea".[53] Hence, it was ruled that a computer program contains only

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[50]   Franklin (714 F2d 50) Timothy S. Teter," Merger and the Machines: An Analysis 1253 of the pro-compatibility trend in computer software copyright cases", *Stanford Law Review*, Vol-45, 1993, p.1081.
[51]   1987 FSRI.
[52]   101 US 99 (1879).
[53]   Quoted in Julian Velasco, "The Copyrightability of Nonliteral Elements of Computer Programs", *Columbia Law Review*, Vol. 94, 1994 p.260.

one idea and that is the purpose of the program. Any portion of the program, not necessary to the purpose was deemed an expression and not an idea. By holding the defendant liable for infringement, the court extended protection to the Structure, Sequence and Organisation (SSO) of the program.[54] Application of this reasoning could hold up for infringement any program developer who has a unique subject code and object code, if his program share a common structure and sequence with another.[55] Even though the case did not address an issue of compatibility, the court's definitions of an idea became a stumbling bloc for achieving compatibility.

The judgment assumes only one idea in a computer program in terms of copyright protection. Given the nature of a computer program this is unrealistic because complex structures of subroutines may have their own separable idea.[56] According to the Top Down design model, the designer breaks down each task into a series of modules and sub-routines which in turn are broken down into their component parts.[57] Thus, each sub-routine has its unique, separate idea. The protection on this SSO was subjected to severe criticism. A program is structured in a particular way for the purpose of efficiency considerations and not for the aesthetic appeal. In short, structuring is a functional operation. Extending protection to SSO is thus a virtual extension of protection for functional aspects, outside the realm of copyright.[58] Moreover, if other ways of expression exist, then the first expression is protected. This means that in a situation where one does have the choice to choose from multiple interfaces, one cannot use the efficient interface if it is protected.[59]

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[54]   Supra note 23 p.2006.
[55]   Ibid.
[56]   Ibid.
[57]   Supra note 24, p.1055.
[58]   Supra note 7.
[59]   Supra note 43 p.1085.

Computer Associates Inc Vs. Altai Inc

Computer Associates Inc Vs. Altai Inc[60] is the landmark case after Whelan, regarding the protection of program interfaces. Here, the plaintiff (Computer Associates) developed an ADAPTOR, an operating-system compatibility component that allows the program to function on various operating systems. Later, the defendant (Altai), hired the plaintiff's programmer to develop its own version for other operating systems, called OSCAR 3.4. Then it was found that 30 per cent of the programe code was copied from the ADAPTOR code. When the plaintiff sued the defendant, they withdrew this version and engaged a new set of programmers to develop a new version called OSCAR 3.5. The District Court found that the first version was an infringement. No infringement was found in the development of the second version. In the appeal, the Circuit Court upheld the decision of the District Court. In doing so, the court applied a new test called as Abstraction-Filtration and Comparison Test.

The test contains three steps:

1. Abstraction : This was done to discover the non-literal elements by a process akin to reverse engineering. It begins with the code of the plaintiffs program and ending with its ultimate function.

2. Filtration: Separation of portable expression from non-protectable expression. Some elements will not be protected as ideas dictated by or incidental to ideas required by external factors (*senes-a-faire* doctrine) or taken from the public domain. These elements are filtered out leaving a case of protectable material.

3. Comparison: A determination of whether the defendant has copied a substantial portion of protected expression and if so, whether this represents a substantial part of plaintiff's program.[61]

The Abstraction test was formulated by Judge Hand in the 1930's[62]. According to this, the elements of a literal program are arranged into a hierarchy

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[60]   (1992) 23 US PQ 2d 1241.

[61]   David Bainbridge, <u>Software Copyright Law</u>, Butterworth, 1997, p.81.

[62]   *In Nicholos V. Universal Pictures corp.* 45 F 2d 119 (2d cir 1930) court held: "upon any work....a great number of patterns of increasing generality will fit equally well, as more and more of the

of levels from the most detailed expression to the most abstract ideas. Regarding Filtration, the court held that the process involves the examination of structural components at each level of abstraction to discover whether, "....... Their inclusion at that level was an 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 a non-protectable expression".[63] The court further went on and listed those program elements which should not be protected by copyright. "......a programmers freedom of design choice is often circumscribed by extrinsic considerations such as (i) the mechanical specifications of the computer on which a particular program is intended to run; (ii) compatibility requirements of other programme with which a program is designed to operate in conjunction; (iii) computer manufacturer's design standards; (iv) demands of the industry being serviced; and (v) widely accepted programming practices within the computer industry.[64] Thus the court applied merger and *sene-a-faire* doctrines along with public domain programs to decide the protectable element in the alleged programme.[65] By applying the abstraction text the court rejected the Whelman's ratio that a program's idea is its purpose. In the process, the court also rejected protection for SSO of a program. The case was acclaimed widely because it applied the traditional copyright principles in the software context and limited the scope of copyright protection for non-literal elements in a program.[66]

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incident is left out. The last may perhaps be no more than the most general statement of what the (work) is about in and at tunes might consists only of its title; but there is a point in this series of abstractions where they are no longer protected, since otherwise the (author) could prevent the use of his "ideas" to which, apart from their expression, his property is never extended" Quoted by Julion Velasco. Supra note 53.   -

[63]   Altai, 982 F.2d at 706, Quoted by Chorles R Mc Manis, "Taking TRIPS On The Information Super Highway: International Intellectual Property Protection and Emerging Computer Technology", *Villanova Law Review*, vol.-41, No-1, 1996 p.237.

[64]   Ibid.

[65]   Infra notes 71-73 and on company text.

[66]   Supra note 53 p.275.

However, ultra-protectionists came done heavily on the judgement. For them, the test is very difficult to apply[67] and further, a copyright issue of a program must be viewed in its entirety under the total concept and feel doctrine.[68] The analytic dissection cannot totally replace a "whole" considered work under Concept and Feel technique.

Another critique is that, in the name of efficiency demands of programmers, little will be left to be protected and this could be a good pretext for copying[69]. Again, the critics leveled the accusation that the decision recognised the constraints of programmers. According to them all creative authors face one or the other constraint Hence, it is not a valid reason for copying.[70]

The decision was criticised from other corners on the basis of application of Merger and *senes-a-faire* doctrines. According to these critics, these doctrines are essentially meant for examining the traditional literary work and not to be applied in a case involving software. Under the *senes-a-faire* doctrine, standard literary elements or 'devices' are not copyright during a literary treatment of a subject matter.[71] The compatibility question differs from stock literary devices. The former works as a communication of a perceived cultural truth and are "deemed necessary because they greatly facilitate the audience' recognition of a particular cultural or historical milieu".[72] So the value lies in the particular expression of the ideas and a work can be performed without this. On the contrary, the program cannot work without compatibility and value lies not in the express but in the idea behind it. Hence it is valued for the results and not the expression. The

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[67]   Supra note 61.
[68]   Jon S. Wilkins, "Protecting Computer Programs as Compilations under Computer Associates V Altai", *Yale Law Journal*, Vol. 104, No 2, Nov-1994.
[69]   Supra note 53 p. 273.
[70]   Arthur R Milles, "Copyright Protection For computer Programs, Databases and Computer-Generated Works: Is any thing New Since CONTU?", *Harvard Law Review*, Vol-106, No-5 1993, p.993 and 1009-10.
[71]   Julie E Cohen, "Reverse Engineering and the Rise of Electronic Vigilantism: Intellectual Property Implications of 'Lock Out' Programs", *South California Law Review* Vol-68, 1995, p.1145.
[72]   Ibid.

applicability of Merger doctrine is also flawed because it is applied in those instances in which expression is otherwise protected by copyright.[73] This mean if there are more ways to perform a function then, according to this doctrine, it becomes an expression. This would be akin to say that there are different types of working and it is copyrightable.[74]

USER INTERFACE

In the early stages of software interface the focus of the programmers was entirely on increasing the computer's efficiency rather than accommodating the user. Of late, the developments in the processing technology and the mass outreach of computers, forced the programers to concentrate on developing programs that would facilitate easy interaction between the computer and the user, as many of the users were are unfamiliar with the intricacies of computer use.[75] The aim was to facilitate the communication between computer and humans at the visual, audial and textual levels. These communication facilities between the user and the computer is commonly known as user interface.

There are mainly three types of interaction between the computer and the user: (a) command language (b) menu (c) graphical display of information. Therefore the success of an interface stems from the collective ability of the designers artists and engineers to encapsulate useful metaphors in electronic form. The user always prefers using a program with which he/she can be well versed and can communicate easily. Thus, user interface plays a crucial role in the market success of a program.[76] Therefore a programmer would want to protect an effective interface program using IPRs. Moreover, user interface is a functional element in a program; one which facilitates communication. Given this functionality, it cannot be protected under copyright. Moreover, due to the

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[73]   Ibid.
[74]   Supra note 36.
[75]   Supra note 43 P.1051.
[76]   Supra note 53 p.248.

network externalities, user interface also sets standards. Therefore any legal protection would help the holder of the standard user interface establish a legal monopoly.[77] But as a result of the Whelan judgement, the protection was extended to cover user interfaces too. A few cases following the Whelan judgement also followed the same reasoning ie. considering user interface per-se as a copyright subject matter.

Lotus Development Corporation *Vs* Paperback Software International

In *Lotus Development Corporation Vs Paperback Software International*[78], the defendant developed a spreadsheet program known as VP Planner seeing the success of Lotus 123; a spreadsheet program developed by the plaintiff. The VP Planner's command arrangement and menu were identical to plaintiff's spreadsheet. Hence, one can transfer the data from Lotus to VP Planner and vice-versa. It was argued that user interface is a useful article and also essential for compatibility. Therefore it did not require protection. Rejecting this argument the court held Paperback liable for copyright infringement. Regarding the useful article defence, the court said "elements of expression even if introduced in useful articles are eligible for copyrighting, if capable of identification and recognition, independently of the functional ideas that make the article useful.".[79] Regarding compatibility the court held "that desire to achieve compatibility and standardisation cannot override the right of others"[80] This reasoning resulted in extending copyright protection to user interfaces.

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77   Supra note 34, p.1344.
78   740 F Supp 37, (1990).
79   Quoted by Julion Velasco Supra note 53, p.265.
80   Ibid.

Lotus Vs Borland International Inc

In *Lotus Vs Borland International Inc*[81], we see an appeal against the judgement of the District Court, which ruled that Borland had infringed the Lotus menu command system in Borland Quattro spreadsheet. The Circuit Court reversed the decision of the District Court and held that menu command system was simply a method of operation like the buttons of a video. The court further held "the fact that there may be many different ways to operate a computer program or even many different ways to operate a computer program using a set of hierarchically arranged command terms, does not make the actual method of operation chosen copyrightable; it still functions as a method of operating the computer and as such is uncopyrightable"[82] This means that even the presence of different ways does not make an idea an expression under copyright laws.

Apple Computer *Vs* Microsoft

In *Apple Computer Vs Microsoft* [83], the court rejected the plaintiff's charges of the defendant having copied their graphic user interfaces. The Appelate Court too rejected Apple's claim that Macintosh GUI was protectable as a whole. Instead, they dissected the GUI into 180 plus individual graphical or pictorial elements. The court found that a majority of these elements were indirectly covered either by a prior license from Apple to Microsoft or unprotectable because they were not granted by Apple or commonly used or functionally dictated. Based on this finding the court held that the scope of protection for GUI as a whole was very narrow. In such a case instead of the Substantial Similarity Copyright Infringement requirement, the court suggested the Virtual Identity requirement. This was because, "the affected expression may provide a basis for a claim of

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[81]   49 F 3d 807 (1995).
[82]   Quoted by Charles Mc Manis Supra Note 63.
[83]   27 USPQ 2d (BWA) 1081 (ND cal).

infringement only if the alleged copy is virtually identical to the plaintiff's version.".[84] Thus the court narrowed the protection for user interface.

The case laws discussed above show that there is an element of continuity from the *Whelan* ruling

1.) all courts accepted the protection for non literal elements.[85]

2.) the idea-expression dichotomy appears to be uniformly regarded as the appropriate vehicle for determining aspects of non literal elements which are or are not eligible for copyright.[86]

3.) even though all these cases apply different methods, they merger and *sene-a-faire* doctrine was uniformly applied instead of identifying function and process. This means that the traditional literary work test was the norm i.e., software analogous to a literary work.[87]

Thus these cases rejected the Whelan's notion that a program's idea is its purpose. Instead they opted for a restrictive definition of a copyright expression. This shows that there is no exact change in the attitude of the courts, regarding their appreciation of the functionality of the software. The courts still apply the doctrines used to determine the copyrightability of literary works. Therefore, the court still refused to focus on whether the elements of an interface constitute a method of operation or a function.[88] Thus by following the literal work analogue and giving protection to interfaces the court went beyond the real function of copyright protection i.e., provide protection for the expression of the idea and not the idea. Further, the protection of interfaces surfaced only in the late 1980's . This shows that historically there is no content in the argument that protection of interfaces increases the innovations.[89]

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[84] W H. Bard Garret, "Toward a Restrictive View of Copyright Protection for Non Literal Elements of Computer Programs: Recent Developments in the Federal Courts", *Virginia Law Review*, Vol-79, 1993, p.2109.

[85] Ibid.

[86] Ibid., also see supra note 70 p.1002.

[87] See supra note 53 pp.159-81.

[88] Supra notes 71 p.1152, also see supra notes 36.

[89] Fred Warshofsky, The Patent Wars, John Willeye & Sons Inc., New York, 1999, p.153.

All the case laws discussed above are decisions of the Circuit Courts. In the absence of any Supreme Court decision or any statutory provisions, the present narrow protection of interfaces has only a persuasive effect. So the possibility of a future overrule by Circuit Courts remains.

REVERSE ENGINEERING

Reverse engineering is a recognized practice in all fields of technology. It analyses the advances made by new products. Reverse Engineering in the software context means the process of understanding the functions of a program. Unlike other technology, the software is mostly available to the public in an object code format. Therefore it is not possible to decipher the functions of the program from the printout of an object code consisting of complex variations of binary numbers (0&1 combinations). Over the years programmer have developed different techniques to reverse engineer a program. They include reading programs manuals to learn basic information regarding the programs operations, performing test runs by feeding a variety of inputs to examine the resulting outputs and converting the network to the programs and then monitoring the programs input and output while it runs.[90] These techniques are commonly known black box reverse engineering. However, these techniques do not provide all information about the interface specifications, which is requisite for interoperability. To achieve these the programmers apply decompilation or disassembly techniques.

These techniques involve the translation of the program's object code into a human readable source code form by using a decompilation or disassembly programs. Essentially disassembly and decompilation are one and the same. However, disassembly involve specifically a code translation from a machine readable format to assembly language format.[91] Decompilation on the other hand

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[90]   Supra notes 9 p.14, also see supra notes 4 p.146.
[91]   Supra note 4 p.147.

is the translation of the object code to higher level language.[92] But the decomplied version does contains labels, comments and mnenomic variables that explains the programs infrastructure because those elements will be stripped out of the programs during compilation . Moreover the program's structure also may change from the original program.[93] Thus the term decompilation is a misnomer, though legally both 'disassemble' and 'decomposition' refer to the same thing.

Even though decompilation gives one a list of human readable instructions, it requires a high level of knowledge, understanding about the program, technical skill, expertise and intellectual contribution to identify and understand program function. Thus it is an expensive and time consuming process to try and decipher the interface specifications and protocols essential for compatibility.[94] Hence, it is in many ways more difficult than writing a program from scratch.

Reverse engineering is required for the following purposes :

i)   to obtain interface specifications necessary for the development of an attaching products or to develop a competent product;[95]

ii)   to obtain information about the capacity and performance characteristics of a program;[96]

iii)   to debug and adopt the program for user's own environment;[97]

iv)   a firm may reverse engineer its own program when it does not fully comprehend the operation of the software either when the person who developed the program left the firm or due to lack of documentation.[98]

Reverse engineering is opposed by the ultra-protectionsts alleging that it results in piracy. The answer depends on the definition of piracy.[99] If one defines

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[92]   Ibid.
[93]   Supra note 9 p.15.
[94]   Supra note 16 p.152.
[95]   Supra note 9 p.17.
[96]   Ibid.
[97]   Ibid.
[98]   Ibid.
[99]   Supra note 28 p.2036.

piracy as the unauthorised, exact duplication of a product, then decompilation does not encourage piracy because for exact copying (piracy) one does not decompile the program. But when the definition of piracy includes the competing program, this allegation is valid. However, this broader definition ignores the fact that the act of reverse engineering and the subsequent development of a competing program does not reproduce an exact copy of the program codes even though it may produce the result. [100] The decompilation gives the programer a right to analyse and study the program. So, a literal copying of the program code still remains an infringement of copyright.

Except the reading of manuals all other reverse engineering techniques need to make an interim copy of the copyrighted program.[101] In the case of decompilation, the making of the decompiled version also becomes an illegal, copy. According to ultra-protectionists this definitely is an infringement of copyright. To counter this, two doctrines, namely Fair use[102] and Adaptation Rights[103] are invoked. According to the first doctrine, since object code is in a machine readable form, one has to understand the idea of the program only from a source code or decompiled version. Thus, it constitutes a fair use of a copy righted work. The second doctrine, gives the owner of the copyright the right to make a copy of the work and also adaptations for the user's convenience. But most of the programs are distributed through licensing and not through sale. The legality of the loading of a program for the purpose of reverse engineering is held valid even in the presence of a provision contrary to this in the licence. This rule was followed in *Valut Vs Quaid*.[104] This cleared the way for all methods of reverse

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[100]   Ibid.
[101]   Supra note 9, p.17.
[102]   See supra note-16 p.15 The fair use doctrine is a valid defence to an otherwise valid aims of Copyright. Also see, W.R. Cornish, Intellectual Property: Palents, Copyright, Trade Mark and Allied Rights, Sweet and Maxwell, 1990, pp. 301-303.
[103]   17 USC 117. Which permits the owner of the program to make backup copy of the program.
[104]   847 F. 2d.

engineering except that of decompilation. The legal validity of the act of decompilation was decided by the Appellate and Circuit Courts in *Sega Vs Accolade*[105] and *Atarai Vs Nintendo*.[106]

Sega Vs Accolade

In *Sega Vs Accolade* the plaintiff made a computer game system comprising a console and a large number of game cartridges. Each cartridge continued an access code that was checked by the console before the game could operate. The defendant decompiled these lockout mechanisms and produced game cartridges which were compatible to the console. Both cartridges contained a common piece of the code. The defendant added this to its program, so as to get access to the plaintiff's console.

The District Court held this as a copyright infringement. In the appeal, the Circuit Court reversed the earlier judgement and held that the decompilation of the object code was a fair use. In doing so, the court rejected Accolade's arguments on the basis of section 117 i.e. decompilation is a permitted use under sec. 117 of Copyright Act. Also, copyright prohibits protection for ideas under section 102.[107]

The court based its reasoning on the fair use doctrine, under section 107 of the Copyright Act. Under this section, to qualify as a fair use, the conditions are: 1.The purpose and character of the use, including whether such use is of a commercial nature or is a non-profit, educational purpose, 2. The nature of the copyright, the amount and substantiality of the portion used in relation to the copyrighted work as a whole and the effect of the use upon the potential market-value of the copyrighted work. Regarding the first condition, the court held that

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[105]   977 F 2d (1992).
[106]   964 F. 2d 965 (9th on 1992)
[107]   Supra note 9 p.187, "Accolde's section (102) based argument consisted the following steps: 1. Computer Programs contain ideas unprotected by Copyright 2. If a program developer distributed it in object code format, a competitor often can, discern the program's unprotected ideas only by disassembling the program. (3) If such disassembly constituted copyright infringement then copyright in effect would protect the program's ideas. (4) Because section 102B prohibits any

presumption of the unfair use can be reverted by the characteristics of the particular commercial use. Regarding Accolade's use, the code felt that "Accolade's identification of the functional requirements for Genesis (i.e the program) compatibility has led to an increase in the number of independently designed video-game programes offered for use with the Genesis console. It is precisely this growth in creative expression based on the dissemination of other creative works and the unprotected ideas contained in those works, that the copyright act was intended to promote".[108] Therefore, the use cannot be called an unfair use.

Regarding the nature test, the court recognised software as utilitarian articles that contain many functional elements in addition to the protected elements. Further, the court said that even though "unprotected aspects of most functional works are readily accessible to the human eye.... humans often cannot gain access to the unprotected idea and functional concept contained in object code without disassembling that code."[109] Finally on this issue the court held that "if disassembly of a copyrighted object code is a per se unfair use, the owner of the copyright gains a de facto monopoly over the functional aspects of his work aspects that were expressly denied copyright by the congress".[110]

About the third factor (Amount of copying/substantiatity) the court held that even though Accolade disassemble the entire program, they used only the needed elements. Therefore, the court held that the amount of copying was minimal. The court finally remarked that "where disassembly is the only way to gain access to the ideas and functional elements embedded in a copyrighted program and where there is a legitimate reason for seeking such access, disassembly is a fair use of copyrighted work as a matter of law.[111]

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direct copyright protection for ideas, it must also prohibit copyright from being used indirectly to protect ideas i.e. by restricting disassembly.

[108] *Sega* Acclode, 977 F 2d, 1523, quoted by Band and Katoh, Supra note 9 p.204.
[109] Ibid. at 1525, p.204.
[110] Ibid. at 1526, p.206.
[111] Ibid. at 1526, p.208.

Atari Vs Nintendo

The basic facts of this case are the same as that of the previous one. However, while obtaining the original program, Atari committed fraud with the copyright office. The federal court upheld the findings of the district court and held that Atari was not allowed to raise a fair use defence because it had obtained the copy of the original program through unfair means. Nevertheless, on the issue of decompilation the court said, "the copyright act permits an individual in rightful possession of a copy of a work to undertake necessary efforts to understand the works ideas, processes and modus operandi".[112] However, the court put a limit to the fair use reproduction of a program. It must not exceed what is necessary to understand the unprotected elements of the work.

Both these cases established the rule that decompilation can be a fair use when it is the only way to gain access to the functional elements and if there is a legitimate reason for such an act.[113] This means, that the legality of decompilation depends upon the facts and the circumstances, which justify the fair use. This creates an uncertainty regarding the legal validity of decompilation. Moreover it raises another question, if the owner of the original program offers the necessary information through license in that case does any body have the right to decompile the original programme. In such a situation the threat of litigation may be used as an effective weapon to discourage competitors from decompiling useful programs.

The ultra protectionists criticise these decisions because a decompilation, according to them, would undermine a copyright owners exclusive rights of reproduction, adaptation and translation of their work.[114] This argument simply ignores the basic function of a copyright that it should protect only the expression and not the idea. Another criticism levelled against these decisions was that

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[112] Atari, 975 F 2d at 842 Ibid. p.213.
[113] Ibid p.214.
[114] Supra note.

decompilation permits a second-comer to create a market substitute and reap the benefit of successful programs after other have incurred the risk and expense of its development.[115] This arguments again, presumes that a copyright's purpose is to guarantee the return of investments made for creating a work at the cost of social benefit.

Lastly the scope of decompilation right available in the light of *Sega*, Atari decisions is said to be wider than the decompilation right available in European community under the directive on the legal protection of computer programs.[116] The directive explicitly allows decompilation by a licensee or another person having a right to use a program, to achieve interoperability of an independently created computer program with other programs.[117] Thus, the scope of decompilation of a program is limited to interoperability. However, both *Sega* and *Atari* permits decompilation, wherever necessary, to get access to unprotected ideas, if it is the only way to get access and is coupled with a legitimate reason.[118] In *Atari,* the Court seems to explain the word "legitimate reason" by stating "the Copyright Act Permits an individual in rightful possession of a copy of a work to undertake necessary efforts to understand the work's ideas, processes and methods of operation".[119] This may help the programmers to decompile the program to get information about unpatentable algorithms in a program.

II   PATENT

Till recently the software fraternity was confused about the implications of the term 'software patent'. The term, under the wider frame work of patent law included

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[115]   Supra note 70 p.1026.
[116]   Joseph Haof, "The EC Directive on the Legal Protection of Computer Programs: Decompilation and Security for Confidential Programming Techniques", *Columbia Journal of Transnational Law*, vol-30, 1992 p.418-49.
[117]   Supra note 9p.214, supra note –63,p244, also see Jerome Huet and Jane. C. Ginsturg, "Computer Programs in Europe: A Comparative Analysis of the 1991 EC Software Directive", *Columbia Journal of Transnational Law*, vol-30, 1992 p.328-73.
[118]   Supra note 110.
[119]   Supra note 112.

only computer-implemented processes and algorithms or a programmed computer, which has a unique set of functionality[120]. The term did not include software per se. Therefore, the term was considered a misnomer. However, the later developments i.e., granting patent to software as an article of manufacture cleared the confusion.[121] Earlier software development was considered more of an art than a process.[122] Therefore, there was not much demand for protecting software under the patent system. However, the development in technology and the independent establishment of the software industry induced the big players to hold their monopoly right through patent regime. For this purpose, the pretext of the incapability of copyright to protect ideas was used as a reason for patent protection[123]. This argument again surfaced, immediately after the judgements in the later second-generation copyright infringement cases. Thus, we see that there was a growing interest among the software companies, to opt for patent protection along with copyright protection.[124] However, the ill-equipped Patent and Trade Mark Office (PTO) issued patents to the trivial technological advances that were already existing in the industry and this resulted in bad patents. This initiated a further debate on the desirability of patent protection for software.

The demand for the patent protection for software started in 1960s when a president commission on the patent system was established in 1965 to address the problems and to suggest revision to the patent Act. Reflecting the policy concern, the commission recommended against patent protection for computer program. The Report stated: "the patent office now cannot examine applications for program because of the lack of a classification technique and the requisite search files. Even these were available, reliable searches would not be feasible or economic because of the tremendous volume of prior art being generated. Without this search, the patenting of programs would be

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[120]   Supra note 4, p.39.
[121]   Supra note 89, p.143.
[122]   Mc Cuthen Online, "What is the Difference? Comparing Patent and Copyright Protection for Software". http://www.mccutchen.com//p.
[123]   See Mark. A. Lemeley and David W.D. Briess, "Encouraging Software Reuse", *Stanford Law Review*, Vol. 49, pp.277-280. (advocacy patent protection has software stating disadvantages of copyright protection).
[124]   Software patent Institute, Software patent Institute Database of Software Technologies – Survey of United States Patent's 1993. The total number of software patent issued in US in 1993 was 3613.

programs would be tantamount to registration and the presumption of validity would be all but non-existent."[125]

Thus the commission rejected the patentability of software not because of its non-patentable nature but due to the lack of infrastructure of the patent office. However, PTO prepared a guideline recommending the protecting of process claims based solely on the computer execution of mathematical formula. These recommendations were withdrawn due to the opposition of hardware manufacturers on the ground that it would block the software user access, which is necessary to promote the development of the technology.[126] Courts and PTO rejected the claims based on software in the subsequent years (Before *Bensen* judgement) mainly on three doctoral grounds. Viz., business systems, printed matter and mental step.[127]

The Supreme Court considered the issue of patentability in *Gottschalk vs. Benson*[128]. The issue in *Benson* was that a claimed invention for converting Binary Code Decimal (BCD) numerals into pure binary numbers. The Supreme Court struck down the claim as being non-statutory subject matter and held that: "It is conceded that one may not patent an idea. But in practical effect that would be the result if the formula for converting BCD numerals to pure binary numerals were patented in this case. The mathematical formula involved here has no substantial practical application except in connection with a digital computer, which means that if the judgement below is affirmed, the patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself".[129]

Since then the *Benson* decision on algorithms became the focal point for analysing the patentability of computer related inventions[130]. Here one should note that the court declined to announce a blanket ban on computer program related inventions.

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[125]   Supra note 4, p.45.

[126]   Ibid.

[127]   Donald S. Chisum, "The Patentability of Algorithms", *University of Pittsburg Law Review*, vol.47, 1986, p.964-71.

[128]   409 US 63(1972)

[129]   Ibid at 71-72, quoted by Gregory A Stobbs, Software Patents, Wiley Law Publishers, 1995, p.42.

[130]   Pamela Samuelson, "Benson Revisited: The Case Against Patent Protection For Algorithms and other Computer Program Related Inventions", *Emory Law Journal*, vol.39, 1990, p.1059.

Regarding the patentability of a computer program the court said: "It is said that the decision precludes a patent for any program servicing a computer. We do not so hold".[131]

However, the Court of Customs and Patent Appeals (CCPA) gave only a narrow interpretation to the *Benson* judgement. On the other hand the patent office gave a broader interpretation to the judgement. According to the CCPA interpretation, the Benson decision forbids patentability of mathematical algorithms only when the granting of patent would pre-empt the use of algorithms.[132] Thus the CCPA made a legal distinction between mathematical and non-mathematical algorithms. This was a technically immaterial distinction.[133] This made it possible to patent the algorithms by attaching it with a physical limitation to show that the patentability of algorithms would not pre-empt the use of algorithms in all fields[134].

In another decision in *Park vs. Flook* [135] the Supreme Court rejected the claim for updating alarm limit (number) used in catalytic chemical conversion of hydro carbons. In doing so the Court held that "the question in this case is the identification of a limited category of useful though conventional postulations. The application of a mathematical algorithm does not make respondent's method eligible for patent protection."[136] Thus the Court held that all known or unknown mathematical algorithms were in the public domain and as such were to be ignored. Further, the Court added a new point of novelty element to decide the patent subject matter. According to this doctrine if the algorithms are the only novel element in a program that does not make the invention patentable. This strengthened the view that the court banned the entire clause of computer software related inventions from patentability.

Following the *Benson and Park* decision the patent practitioners started drafting the software invention as hardware invention by disclosing significant computer hardware details along with the software claims within the patent specification.[137] As a

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[131]   Jeffrey S. Draeger, "Are Beauregard's claims really valid?" *John Marshall Journal of Computer and Information Law*, vol.17, no.1, 1998, Down loaded from www.findlaw.com/Journals.
[132]   Supra note 1130, p.1063.
[133]   Infra note.154.
[134]   Infra note.18.
[135]   437 US 584(1978)
[136]   Ibid. at 598-600, quoted in supra note 11, p.1080.
[137]   Keith E. Witek, "Developing a Comprehensive software claim Drafting Strategy for US Software Patents", *High Technology Law Review*, Vol. II, issue 2, fall 1996, downloaded from www.findlaw.com/journals.

consequences of *Flook*, hardware and physical limitations other than the software needed to be novel. In response to this, the patent practitioners started processing claims with significant structural limitations far beyond mere post solution activity[138]. The CCPA also started considering print output as a post solution step that would save the claim from being found as unprotectable under the *Benson* rule.[139] It also started a new emphasis on the industrial character of a program related claim.[140]

The Supreme Court in yet another decision in the wake of *Diamond vs. Chakravarthy*[141] in *Diamond vs. Diehr*[142] held that the application of a mathematical computation of the Arrhenius equation for calculating the curetime of rubber in order to determine the time to open the door was a traditional patentable subject matter. The Court reasoned "Arrhenius equations is not patentable in isolation but when a process for curing rubber is devised which incorporates in it a more efficient solution of the equation, that process is at the very least not barred at the threshold by Section 101".[143] Here, the court made a distinction between *Flook* and *Diehr* claims. In the former claim, the algorithms were used in abstract without limiting the objective elements of a patentable process whereas in the latter it was so limited.[144] At the same time by stating that "the novelty of any element or steps in a process or even of the process itself, is of no relevance in determining the statutory subject matter"[145], the Court further departed from the point of novelty requirements set in the *Flook* case. The Court further clarified that in *Benson and Flook* the claims had been for mathematical formula but here *Diehr* was only seeking to forbid others from using the equations in conjunction with the whole claimed process[146]. This proposition begs a question as to how an unpatentable discovery of a law of nature becomes patentable when applied to a known structure.

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138   Ibid.
139   Supra note 130, p.1088, Courts allowed claims for improved methods of seismic analysis, automatically recorded on a paper.
140   Ibid., p.1089.
141   447 US.303 (1980)
142   450 US.175 (1981)
143   Supra note
144   Supra note 129, p.46.
145   Allen B. Wagner, "Patenting Computer Science: Are Computer Instruction Writing Patentable", *John Marshall Journal of Computer and Information Law*, Vol.17, no.1, 1998, downloaded from www.findlaw.com/journals.
146   Supra note.130, p.1096.

In the post *Diehr* period, the Courts started applying a two step test called *Freeman-Walter-Abele* Test to differentiate non-mathematical algorithms from mathematical algorithms. This was in line with the Courts earlier interpretations on the Benson ratio. The *Freeman-Walter-Abele* Texts involves two steps:

> Firstly, a determination as to whether a mathematical algorithm is recited directly or indirectly in the claim. If so, the next step aimed to determine whether the claimed invention is no more than the algorithm used i.e., whether the claim is directly related to the mathematical algorithms that is not applied to or limited by the physical elements of process steps. Such claims are non-statutory. However, when the mathematical algorithm is applied in one or more steps of an otherwise statutory apparatus claim the statutory requirement is met. [147]

The test effectively narrowed down the scope of *Benson* and *Flook* mathematical algorithm limitation of patentability from all software claims to software related inventions with a mathematical algorithm. In the next seven years there were not many disputes regarding this practice. The PTO also became liberal in awarding patents to software related inventions. This liberal approach on the part of the PTO and the Court to the physical limitation of the claim proved that the limitation of the *Freeman-Walter-Abele* Test was not much of a barrier. Any physical element or steps which satisfied the physical limitation test became patentable. For example, the Federal Court clearly held that in *Allappat* a claim for the use of general purpose computing equipment to perform a mathematical operation recites a patentable apparatus. According to the Court, "a general purpose computer in effect becomes a special purpose computer once it is programmed to perform, particular functions pursuant to instructions from programme software."[148]

In *Lowry* a claim for a method of sorting and managing data in a computer memory was held patentable by the court which reversed the PTO's rejection. According to the PTO, the claims merely recited the arrangement of data and the computer memory that served as the substrata. The Court held that the printed matter cases have no factual relevance where the inventions defined by the claims requires that information be processed not by a mind but by a machine, the computer. Also, the Court found that "it

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147   Supra note.137.
148   Supra note 70, p.1156.

was the specific electronic structural element which impart, a physical organisation on the information stored in memory."[149] It reasoned that if the claimed implementation causes change to the electronic structure of the included computer programme then the claim was contained in the physical structure. Therefore, if the claim involves the physical structure, then it involves patentable subjects. This was either a machine or an article of manufacture under Section 101. This meant that there was no need to apply the *Freeman-Walter-Abele* Test. As a logical consequence to this the PTO granted patent in the *Beaurgued* claim on software as an article of manufacture composed of a computer readable medium in which the programme code is embedded[150]. Thus, software per se is patentable. The new examination guidelines for computer related inventions by the USPTO also recognise software as an article of manufacture. It reads:

> "When a functional descriptive material is recorded on some computer-readable medium, it becomes structurally and functionally interrelated to the medium and will be statutory in most cases. When a non-functional descriptive material is recorded on some computer-readable medium, it is not structurally and functionally interrelated to the medium but is merely carried by the medium. Merely claiming non-functional descriptive material stored in a computer readable medium does not make it statutory. Such a result would exalt from over substance. Thus, non-statutory music does not become a statutory by merely recording it on a compact disk. Protection for this work is provided under the copyright law.[151]"

Thus, software contains instructions to the computer as an article of manufacture. Thus the physical requirements for software is limited to a computer readable medium. Thus, in effect, algorithms can be patented. This qualification for the computer readable medium is widely criticised. According to the critics, the computer readable medium is not a limitation at all in terms of the advancement in technology. Thus, in the advancement of scanning technology, a hand-written computer instruction will qualify as

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[149] Vincent Chiappetta, "Patentability of Computer Software Instruction as an Article of Manufacture: Software as such as the Right Stuff", *John Marshall Journal of Computer and Information Law*, Vol.17, issue i, 1998, downloaded from www.finelaw.com.

[150] Ibid.

[151] US PTO, Examination Guidelines for Computer Related Invention, US Department of Commerce, Washington DC, 1996, p.9.

a functional matter once the computer system can scan automatically and read the instructions written on a paper and then compile and execute the code[152].

Software is different in many respects from the conventional technology[153]. Firstly, it is more complicated than any other products. In most the industries a product could contain 22-25 parts. However, software is free from such constraints. A major computer program may contain up to 10,000 million lines of code. Therefore, unlike other products, which contain a few parts, software products contains a large number of inventions. Secondly, software is more abstract. A software product depends on different computer technologies. One cannot make a distinction among these technologies. Thirdly, software technology evolves much more rapidly than the conventional industry. Unlike the conventional industry, which generates a new product in a very long span of time, the software industry product changes its generation much faster. Therefore, the application of patent regime for the protection of software invention when compared with the conventional industry, is found to be incapable of achieving any of its desired goals. Moreover, the reason for the rapid technological development in software industry is due to the free exchange of information between the programmers in the earlier days. Thus, innovations in software are incremental in nature.

Further, the software industry is a market driven industry and not a technology driven industry. It is not the control over the technology that matters but the implementation of already existing technologies for the customers' requirements that lead to success. None of the present day software giants invented any of the existing technologies but they implemented it in a better manner[154].

III.   TRADE SECRET

Trade secret law protects certain types of confidential, technical or business information against unauthorised use or disclosure. It is a mixture of common law and contract. In the US, it falls within the domain of state laws but many states

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152   Supra vote 12.
153   Gordon Irlam and Ross Williams, Software Patents: an Industry at Risk, downloaded from www.leageforprogrammingfreedom.org.
154   Infra note 177.

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adopted a uniform trade secret Act (UTSA).[155] The Restatement of Tort defines trade secret as follows:

A trade secret may consist of any formula pattern, device, or compilation of information which is used in one's business and which gives him an opportunity to obtain an advantage over competitors who do not know or use it. It may be a formula for a chemical compound, a process for manufacturing, treating or processing materials, a pattern for a machine or other devices or a list of customers.[156]

One of the basic requirements for an information to qualify as trade secret is its independent economic value.[157] Also, there should be a reasonable effort on the part of the trade secret holder to keep the information secret.[158] Thus, licensing i.e. creating a contractual obligation is claim to be an affirmative action to protect the trade secret. Unlike patent, trade secret neither requires a public declaration nor a stringent standard. Further, the duration of protection is not limited.

Initially, trade secret law was the widely used form of IP Protection in software. At that time the software was mainly custom tailored and therefore confidential relationship through a contract was obtained through a signed written agreement. However, in an era of mass-marketing of software, protecting the software as a trade secret became doubtful. The software industry responded to this with Shrink-Wrap license which held that marketing a software should be in a sealed package with a copyright notice and a licensee agreement that is visible on the exterior of the package. The opening of the package is deemed an acceptance of the terms and conditions of the license.

The rationale behind Shrink Wrap license with a copyright notice is the protection of the idea as well as the expression.[159] The theoretical base of doing so

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155   Supra note 4, p.39.
156   Restatement of Torts, section 757, comment b, at 5, Quoted in OTA Report, p.79.
157   Ibid.
158   Ibid.
159   Ibid.

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is that while copyright protects the expressive elements in a program, the license will protect the idea behind the program. For this, it assumes that the distribution of software in object code form would satisfy the reasonable effort required to maintain the secrecy.[160] Further, it also argues that through a license/contract a confidential relation is established between the licenser and the licensee to maintain secrecy.[161] Software publishers also claim that sale of software is not a sale at all, but a license to use. The rationale for this argument is that it can avoid the owner from getting a right to make a back up copy of the program under section 117 because such a rights available only to the owners of the program and not to the licensee.[162] However, the courts in US has not yet accepted, till recently, the validity of this claim.[163] Thus licensing was treated as equivalent to a sale.

The main controversy about Shrink-Wrap agreements in the context of software IP protection is centered around the validity of prohibition of decompilation and disassembly provision in the agreement. The other controversial provisions include disclaimer of warranties application of a remote jurisdiction law, prohibition on resale etc.[164] There are three main views regarding this issue.[165] According to the first view Shrink-Wrap license alone is not a reasonable effort to maintain trade secret. Further, this view also holds that a contractual or confidential relations cannot be enforced against reverse engineering. Second view argues from a copyright angle that reverse engineering is a fair use permissible under copyright law. Moreover the Shrink Wrap license attaches the copyright notice. Hence it cannot prevent the user from copying the non copyrightable expression. The third view argue that the Shrink Wrap agreement can be enforced as a contract.

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[160]   Michel Liberman, "Overreaching Provisions in Software License Agreements", *Richmond Journal of Law Technology*, http//www.richmond.edu/jslt/vlil/liberman.html 1995.

[161]   Ibid.

[162]   Supra note 4 p.85.

[163]   Pamela Samuelson, "Does Information Really Want to be Licensed?" *ACM communications*, Sept. 1998. Downloaded from www.findlaw.com./Berkeley Technology Law Journal/UCC.

[164]   Ibid.

[165]   Supra note 4, p.85.

Regarding the support of the third view it is argued that contract is a *rights in personum*, while copyright law creates a *'rights in rem'*.[166] Therefore a contract can be enforced even in the presence of a federal law. However, section 301(b) of the Copyright Act prohibits any contracting "activity violating legal or equitable rights within the general scope of copyright as specified in section 106."[167] Hence, it is widely held that a prohibition on reverse engineering is a violation of the above mentioned provision.[168] Because such provision would be pre-empted by the Federal law. This view is further corroborated in the case laws starting from *Vault Vs Quaid* to *Atari Vs Nintendo*. In these cases, the court expressly held reverse engineering as a fair use right available under copyright law. In this regard, the European law is more clear. It explicitly invalidates any provision which prohibits reverse engineering in the licensing agreements.[169]

IV. IMPLICATIONS FOR DEVELOPING COUNTRIES

Developing Countries like India, Brazil, Philippines et al. have shown their presence in the international software industry. The unique features of the software industry viz low barriers to entry, low labour cost, etc worked to their advantage[170]. Despite their late market entry, these countries are begining to catch up with the rapidly advancing computer technology.[171] Even those developing

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[166] Niva Elkin-Koren, "Copyright Policy and the Limits of Freedom of Contract", *High Technology Law Journal,* Vol-12: Spring, 1997, Downloaded from www.finlaw.com /journals

[167] 17 USC 301 (b).

[168] David A.Rice, "Public Goods, Private Contract And Public Policy: Federal Preemption of Software License Prohibitions Against Reverse Engineering", *University of Pittsburgh Law Review*, Vol. 53, Spring, 1992, pp. 543-630. Also see, David Bender, "Protection of Computer Programs: The Copyright/Trade Secret Interface", *University of Pittsburgh Law Review*, Vol. 47, 1986, pp. 907-58.

[169] European Directive on the legal protection of computer programs 91/250/EEC. Article 9 States: "1. The provisions of this directive shall be without prejudice to any other legal provisions such as those concerning patent rights, trade-marks, unfair competition, trade secrets, protection of semi-conductor products or the law of contract. Any contractual provisions contrary to Article 6 or to the exceptions provided for in Article 5(2) and (3) shall be null and void."

[170] See Carlos Correa, "Strategies for Software Exports from Developing Countries", *World Development*, Vol.24, No.1, 1996 pp.171-182

[171] J. Reichman, "Implications of the Draft TRIPS Agreement for Developing Countries as Competitors in an Integrated World Market", *UNCTAD Discussion Paper*, No.73, 1993, p.11

countries who are already in the market are handicapped by the lack of infrastructure and by a shortage of high level design skills and tools[172]. Further, the computer firms from the developed countries are charging high prices for the computer programs sold to the developing countries. This not only retards the efforts to close the technological gap but also induces large scale copying[173]. The higher price is unjustifiable because unlike the conventional industrial goods reproduction cost of software is marginal. (often it is zero[174]). The copying strategy to counter the price sometimes proves inimical to the developing countries in the later stages because the copiers never spare anyone. This adversely affects the local suppliers who are trying to maintain a foothold in the market[175]. The developing countries' I P protection policy towards software has to be drawn in this context. While providing reasonable guarantee to software developers, it should ensure that the innovators retain access to technological ideas and also to the technical information required to attain interoperability and compatibility between systems whenever necessary.[176]

The software IP protection scenario in the developed countries, especially in the U.S., shows that all the three options for IP protection in software are kept open. This cumulative protection takes care of the loopholes in each mode of protection. This creates a monopoly in the international software industry. A stringent protection regime in the US is a matter of concern to a country like India. This is because such a protection would work as a trade protection strategy and would in turn block the export of competing software products from the developing countries. Further, it may create a pressure on these countries to create the same level of protection in their domestic laws.

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[172]   Supra note-170.

[173]   Supra note-171.
[174]   Robert Verzola, "Globalization: The Third World", paper presented in *International Conference on Colonialism and Globalization*, Feb 2-6, 1998, New Delhi, pp.7-8
[175]   Supra note-170.
[176]   UNCTAD, Trade and Development Report, 1991, p.187

Applying the present IP paradigm in the software context has no factual basis either in history or in the present practice of the software industry. The primary reason for the rapid advancement in the computer technologies is due to the free exchange of ideas among programmers and scientists. Moreover, the success of the software industry giants is not due to IP protection but because of the quality of their products[177]. In the era of the internet, wherein companies are going in for open standards, the protection of interface specification does not make sense.[178] The dynamic nature of an economy also endorses this. A critic of the IPR paradigm writes that "the historical model was that in order to get venture capital, the companies needed proprietary technology. Now in the post-Netscape world, people are beginning to rethink that model. It might take eighteen months to get a patent that has twelve months lifecycle....So people are focusing less on proprietary assurance and more on first-move advantage.[179]" Thus, holding a traditional model to protect a new technology like software does not serve the proclaimed result. On the contrary, it helps to establish a monopoly and blocks the rapid technological advancement of the software industry.

Free access to interface specification is necessary to make compatible and competing products and also for the maintenance of high performance standards[180]. The majority of *de facto* standard interfaces are produced by the large corporations. As a corollary to the reproduction right of interface specification, reverse engineering is to be made legal. Because, as stated earlier, it is necessary to understand the functions of the program. Any "Strict rules prohibiting all forms of reverse engineering would adversely affect the developing countries' capacity to create or expand domestic software industries"[181]. Further,

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[177] Simon L. Garfinkel, Richard M.Stallman and Michael Kapor, "Why Patents are bad for Software", *Science and Technology* ,Fall 1991, downloaded from www.lpf.org/epprely
[178] Edward J. Zander, President, Sun Microsystem, *Times of India*, Oct.21, p.12
[179] Jerry Useen, "Forget Patents: says Stanford Prof.", *Inc.*, Oct., 1996, p. 23.
[180] Supra note-176.
[181] Ibid.

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reverse engineering is required on public policy grounds to ensure competition and the availability of products at affordable price to consumer, the dissemination of science and technology and also for the access to the technology. Any prohibition on reverse engineering and the free reproduction of interfaces deprives the software industries in the developing countries from developing competing products and access to the technology which has been used by the industries in the developed countries. Therefore, any copyright protection that goes beyond the program code to the structural elements of a programs or its interfaces would impede the technology transfer that is necessary for the development of the domestic software industry in the developing countries.[182]

Of late, a large number of patents were issued to computer programs in the U.S. and in other developed countries. According to the new examination guideline on program related inventions of the U.S. Patent and Trademark Office, software patents are recognised as an "article of manufacture". Thus, software *per se* is patentable today. Any liberal policy on software patenting will stop the independent creation of software .now available to other developers. This is because even an independent replication of a patented idea becomes an infringement. Further, it closes the options of reverse engineering and the free use of the interfaces of a patented software. Anti-competitive licensing practices of software companies have already come under severe criticism. Any legislation supporting such practices in the name of freedom of contract would hamper the industry as well as the consumers in the developing countries.

In the light of the above discussion, it is very clear that any replication of policies of the developed countries would retard the growth of the domestic software industry in the developing countries. Moreover, software technologies, apart from being an industry, have increasingly proved its role as an effective

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[182] Dennis S. Karjala, "Theoretical Foundation for the Protection of Computer Program in Developing Countries", paper presented at *International Conference on Intellectual Property Rights in Computer Software and their Impact on Developing Countries*, August, 19-21, 1993, p.16

instrument to fulfill the demands of development. Therefore, any IP policy initiative on software in the developing countries should give more importance to the right of access and the protection of the inventors' right. In other words, the policies should set the purpose of IPRs in its real meaning. i.e. ensuring the dissemination knowledge for the social benefit.

CHAPTER-III

Software IP Protection:
The Indian Scenario

CHAPTER III

SOFTWARE IP PROTECTION: THE INDIAN SCENARIO

This chapter discusses the IP protection of software with reference to the Indian legal system. In addition, the response of the Indian legal system towards the crucial issues in software IP protection raised in the previous chapter will be examined. Schematically, the chapter will contextualise the various aspects of copyright, patent and trade secret and contract with respect to the Indian legal system.

I   COPY RIGHT

India legislated its own Copyright Act in 1957. In doing so, it repealed the then existing colonial act enacted during British times. The new Act was subsequently amended- in 1984, 1994 and most recently in 1999. One notable feature of the Act is that it is silent about the purposes and objectives of providing copyright protection. However, we can assume that the objectives/purposes of the Act are not different from any other country following the common law tradition (e.g.: Britain); i.e, the protection is not for the idea (but for the form) and is meant to safeguard the public interest. This has been reiterated in the various court judgments regarding copyright.[1]

Copyright protection in India is available to all original literary, dramatic or musical work, cinematographic film, artistic work and sound recording subject to

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[1]   R.G. Anand V Deluse Film, AIR (1978) SC 1613 "Thus, the position appears to be that an idea, principle, theme, or subject-matter or historical or legendary facts being common property cannot be the subject of matter of copyright of a particular person. It is always open to any person to choose an idea as a subject-matter and develop it in his own manner and give expression to the idea by treating it differently from others. Where two writers write on the same subject similarities are bound to occur because the central ideal of both is the same but the similarities or coincidences by themselves cannot lead to an irresistible inference of plagiarism or piracy.

the provisions of the Act. In the 1994 amendment, the scope of the Act was expanded to incorporate the rights of performing artists and broadcasters.[2]

However, the originality requirement of a literary work to qualify for copyright protection is minimal compared to patent protection.[3] "It is not on the originality of ideas that copyright stresses, but the originality of expression of ideas".[4] The compulsory licensing provisions were included to safeguard the public interest in those fields of copyright where modern technology plays a crucial role.[5] This incorporation too was done through the 1994 amendment.

Generally speaking, there is a two step test to establish the infringement of copyright.[6] Firstly, there should be a sufficient and substantial similarity between an original work and the infringed version. Secondly, the work being contested must be a derivation of the copyright work. The Act provides three types of remedies against such infringements viz - civil, criminal and administrative. The civil remedy includes injunctions, damages, and the delivery of infringed copies to the copyright owner.[7] The criminal remedy encompasses imprisonment, fine, seizure of infringed copies and the delivery of the infringed copies to the copyright

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[2]   Section 37 & 38 the Copyright Act 1957.

[3]   N.S. Gopalkrishan, Intellectual Property and Criminal Law, National Law School, Banglore, 1995, pp. 157-58.

[4]   Ibid.

[5]   P. Naryanan, Copyright and Industrial Designs, Eastern Law Book House, Calcutta, 1994, p. 118.

[6]   Supra note 1, "where the same idea is being developed in a different manner, it is manifest that the source being common, similarities are bound to occur. In such a case the courst should determine whether or not the similarities are on fundamental or substantial aspects of the mode of expression adopted in the copyrighted work. If the defendant's work is nothing but literal imitation of the copyrighted work with some variations here and there it would amount to violation of the copyright. In other words, in order to be actionable the copy must be substantial and material one which at once leads to the conclusion that the defendant is guilty of an act of piracy.

    One of the surest and the safest tests to determine whether or not there has been a violation of copyright is to see if the reader, spectator or the violation of copyright is to see if the reader, spectator or the viewer after having read or seen both the works is clearly of the opinion and gets an unmistakable impression that the subsequent work appears to be a copy of the original.

    Where however a part from the similarities appearing in the two works there are also material and broad dissimilarities which negative the intention to copy the original and the coincidences appearing in the two works are clearly incidental no infringement of the copyright comes into existence.

[7]   Section 55.

owner.[8] The administrative remedy includes the placement of a ban on the infringed copies, delivery of the infringed copies to copyright owner etc.[9]

The administration of copyright protection comes under the Human Resources Development Ministry. The Act entrusted the responsibility of copyright administration to the Copyright Office headed by the Registrar of copyright.[10] There is also a Copyright Board, constituted under the Act, to discharge certain judicial functions. These functions include facilitating license to the works of copyright owners, settling disputes regarding royalty etc.[11] The Act also provides for copyright societies which carry on the business of issuing and granting license for the copyright works.

Computer Software

Since the 1984 amendments the Copyright Act provides explicit protection for computer software as a literary work. The said amendment, among other things, amended the definition of a literary work to include computer programs also. The clause also specifically defines the term 'computer program'. Apart from this, the amendment did not bring any change in the Copyright Act with regard to computer software protection. This laxity in bringing about a total change of perspective can be attributed to a number of reasons. The amendment only proposed to make a beginning; "to give statutory protection to computer programmes by including it under the definition of a literary work as in other countries and thus allowing it to be governed by all the provisions applicable to a literary work under the Copyright Act.[12] This lacunae was cured in the 1994 amendment which provided extensive provisions to strengthen the protection of computer software. The new amendment changed the following provisions

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[8]   Section 63-70.
[9]   Section 53.
[10]   Section 9-10.
[11]   Section 11-12.
[12]   S. Ramaiah, "IPR in Computer Software and Micro Electronics", Paper Presented at DSIR Conference on Research and Development in Industry, November, New Delhi, 1995.

pertaining to software protection: the definition of a literary work, the definition of a computer program, computer, and author, the meaning of copyright, fair-use provisions, known-use of infringing copies and compulsory licensing.

This reconceptualization of technical terms was perhaps imperative for the IPR for software to be more efficient. Till the inception of the 1994 amendment, 'No other provisions were included in the Act to provide for efficient protection to computer software as a literary work. Even the explanation of computer programms included in the definition of a literary work, was not considered to be satisfactory as it had not provided for the entire gamut of computer software'[13]. Also, the amendment effected by India in 1984 was too hasty as far as effective copyright norms are concerned. Only four years had passed after the US had amended its Copyright Act. Even Britain was in the process of finalizing its alterations to the Act (the new British Copyright Act came out in 1985).[14] More importantly, the second generation copyright cases (in the US) emerged only in the late 80's. Therefore, it was not possible to conceive the various problems aligned with the IP protection of computer software. The only perception about software protection then was to consider it as a literary work and protect it from literal copying.

It was to set right these shortcomings that the Act was subsequently amended in 1994. Though stringent norms were provided for ensuring protection to computer software, it has to be said that in the urge to revise the loopholes, the legal regime failed to take into account the realities of the domestic software industry. The end product was an Act that was not quite conducive to the economic and market needs of the software industry and hence the Act failed to achieve its objective of providing a viable environment in which it could flourish. It was this shortcoming that necessitated a further amendment in 1999. The Bill has already been passed in the Rajya Sabha and expects a smooth ratification in

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[13]   Ibid.
[14]   David Bainbridge, Software Copyright Law, Butterworth, London, 1997, p.43.

the Lok Sabha. This amendment aims to dilute the stringent provisions of the 1994 amendments.

Definitions

The 1984 Amendment extended copyright protection to computer software as a literary work. The definition also explained the term 'computer program'. It read: "... a literary work includes tables, compilations and computer programmes. That is to say, programmes recorded on any disc, tape, perforated media or other information storage devices which, if fed into or located in a computer or computer based equipment, is capable of reproducing any information".[15] This definition clearly puts a computer program in the literary work scheme for copyright protection.

Consequently, all principles of protection available under the Act pertaining to a literary work were made available to the computer program. It was indeed a crucial step regarding the protection of computer software in India and other developing countries. It was the time when the debate regarding the right mode of protection for computer software (i.e. whether copyright is the apt mode of software protection) was going on within WIPO.[16] The early recognition that India gave to computer programs as a literary work, so as to facilitate its protection under copyright, turned out to be an adverse step because it affected our future bargaining pertaining to IP protection for computer software in the international arena. The early analogue of regarding computer software as a literary work considerably limited the right of India as well as of other developing countries to appreciate the functionality of software while framing their domestic law.[17] This schism (between international and domestic law) was made adequate use of by

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[15]   Section 2(0) of Copyright Act till 1994 amendment.
[16]   N.S. Gopalkrishan, "Computer Software Protection, the Dunkel Draft Text and The Indian Copyright Law", *The Academy Law Review*, Vol. 17, 1993, p-35.
[17]   UNCTAD, *Trade and Development Report 1991*, p. 187.

France, Japan and Brazil who not only opted for other modes of computer software protection but also refused to recognize computer software as a literary work.[18] Thus, by the early acceptance of the literary work analogue, India lost the chance to appreciate the functional character of computer software, both in the domestic and international spheres.

The 1994 amendment redefined the terms 'a literary work' and 'a computer program'. It also introduced a new definition for 'computer'. The new definition of 'literary work' stated that a 'literary work includes computer programs, tables, compilation including databases'.[19] The objective of the new definition was to make the definition of a literary work compatible with the definition of 'computer' and 'computer programs'. The 'computer' was defined as, '... including any electronic or similar device, having processing capabilities'.[20] Thus, the definition includes any other machine having electronic or similar devices for information processing. The term 'electronic' and 'information processing' have not been defined in the Act. Therefore, the definition includes not only computers, but also video games, calculators, electronic dairies etc. Further, the Act redefined a computer program as 'a set of instructions expressed in words, codes, schemes or in any other form including a machine readable form, causing a computer to perform a particular task or achieve a particular result.'[21] Thus, the definition includes almost all forms of software namely, source code, object code, machine readable chips, operating system, micro codes etc.

A combined reading of all the three definitions clarify all doubts about the coverage of protection under Copyright to any form of software including the source code. However, the definition is not clear about whether it includes the preparatory design materials of the program. But one can claim protection for those materials as a literary work. The earlier definition never defined what

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[18]   Ibid.
[19]   Section 2(0) after 1994 amendment.
[20]   Section 2 (ffc).
[21]   Section 2 (ffb).

exactly a computer program is. The new definition sets it down as a set of instructions and tries to cement the literary work analogue. But one is forced to doubt the efficacy of the literacy work analogue when the definition says that the instruction can cause the computer to perform a task or achieve a result. However, the major flaw of the definition lies in its understanding of the technology.[22] According to definition, "a set of instructions expressed in words, codes, schemes or in any other form causing a computer perform a particular task or achieve a particular result. This is technically impossible unless the set of instructions expressed in different forms are incorporated in a machine readable form. Likewise, a machine readable medium without incorporating the set of instructions in words, schemes etc. cannot cause a computer to perform. Here, the functional capability of the software is ironically being recognized. On the other hand, the US definition sets down a computer program as a set of statements to be used directly or indirectly in a computer to bring about a certain result. Here, it is not clear as to who/what performs the function. On the contrary, the Indian definition recognizes a distinction between a computer and a computer program. This distinction is technically baseless because one can interchange software and hardware. (That is, one can use the hardware to perform a software function and vice versa).

Author and Owner

According to the Copyright Act, an author of a literary work shall be the owner of the work under normal circumstances. Therefore, a programmer is the owner of a program written by him.[23] A computer program may, however, need the effort of a skilled group. In that case, all members of a team which develops a program gets a right in the respective part of the program. In the case of

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[22] Supra note 12, p. 118. Also see, V.K. Gupta, "Protection of Computer Algorithm", *Journal of Intellectual Property Rights*, Vol. 1, March 1996, p. 81.

[23] Section 17.

inseparability, the whole group gets a collective right. But, in the case of employment under a contract of service or an apprenticeship, the employer shall be the first owner of the copyrighted work in the absence of any agreement contrary to this. The purpose behind such a provision is to increase the bargaining power of the programmer.[24] But in most cases, a programmer is an author without ownership due to the employer-employee relationship. However, the issue arises when an employee, not incharge of developing a program, develops a program when not in the course of his work and then uses it for the work at hand. The question crops up as to who is the owner of such a program? In this situation, it would perhaps depend upon the terms and conditions of the contract.[25] The Act also deprives the programmer of the right to sue the owner on the grounds of moral right.[26]

Rights of the Computer Program Owner

According to the 1994 amendment the owner of a computer program gets exclusive rights under Section 14(a) as the owner of a literary work.[27] The owner of a computer program is entrusted with a set of exclusive rights to 'sell or give on hire, or offer for sale or hire, any copy of the computer program regardless of

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[24] Supra note 16, p. 41.
[25] Supra note 14, pp. 202-208.
[26] Section 57- "Independently of the author's copyright, and even after the assignment either wholly or partially of the said copyright, the author of a work shall have the right-
    a.   to claim authorship of the work; and
    b.   to restrain or claim damages in respect of any distortion, mutilation, modification or other act in relation to the said work which is done before the expiration of the term of copyright if such distortion, mutilation, modification or other act would be prejudicial to his honour or reputation:
Provided that the author shall not have any right to restrain or claim damages in respect of any adaptation of a computer programme to which clause (aa) of subsection (1) of section 52 applies".
[27] Section 14 (a). "in the case of a literary, dramatic or musical work, not being a computer programme-
    i.   to reproduce the work in any material form including the storing of it in any medium by electronic means;
    ii.   to issue copies of the work to the public and not being copies already in circulation;
    iii.   to perform the work in public, or communicate it to the public;
    iv.   to make any cinematograph film or sound recording in respect of the work;

whether any such copy has been sold or given on hire on earlier occasions'.[28] Thus, the owner procures every right irrespective of past practices. This provision restricts the resale right of anyone who purchases the program. It also prohibits the hiring of a program by a third party. However, the word 'hire' is not defined as to whether it includes all forms of hiring or only the commercial hiring. In the absence of any specification, it may be assumed that 'hire', in this context, includes all forms of hiring. Thus, the purchaser is left with only one right-the right to use the program.[29] This is well beyond the jurisprudential concept of copyright protection. It is also at loggerheads with the literary work analogue. It has to be noted that in all other countries, only commercial rental of computer programs is prohibited by law.

In response to this criticism, the recent amendment (1999) has sought to clarify the position by a substitute provision in Section IV (1) (b) (ii): 'to sell, or give on commercial rental, or offer for sale, or for commercial rental any copy of the computer programme, provided that such a commercial rental does not apply, in respect of the computer program, where the program itself is not the essential object of the rental'.[30] Thus, according to the new provision, the owner of the program has only an exclusive right for commercial rental or offer for commercial rental along with the right to sale or offer for sale. Moreover, commercial rental would not apply in case of a rental in which the program is not the essential object of the transaction. However, the amendment fails to address the issue of the purchaser's right to resale. Here too, the Act has gone beyond the proprietary scope of copyright protection. One of the basic principles of copyright protection is the First-sale-Exhaustion doctrine. According to it, the owner cannot control the subsequent sale (resale) of the copies even if they are copyrighted. In other words, the copyright owners' exclusive right to sell exists only till the first sale of the

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28   Section 14 (b).
29   Supra note 14, p. 42.
30   Section 3 of the Copyright Amendment Bill, 1999.

copyrighted work. At this juncture, if we compare the European Commission directive's provision with the Indian Copyright Act, it will be clear as to how our law has brought about an overreaching of ownership right pertaining to computer software. According to the EC provision: 'the first sale in the community of a copy of a programme by the right-holder or with his consent shall exhaust the distribution right, within the community, of the copy with the exception of the right to control further rental of the program or a copy thereof'.[31] It is clear that the EC directive explicitly provides resale rights to the purchaser. The exclusive right to sell also checks the parallel import provision which is available under the TRIPS agreement in the absence of any provision to do so.[32] The scope of the compulsory license provision of the Copyright Act is very limited and it can be invoked only in the case of the publisher refusing the publishing of the work and not against anti-competitive practices or further safe guarding of public interest (like the availability of a work at a reasonable price, etc.).[33]

Fair-Use

Fair use exemption in copyright is for the purpose of safeguarding public interest. It permits the public to take certain parts of a work to use it in another work. Unlike the US Act, the Indian Act gives a list of exempted uses of a copyrighted work. Hence, there is no need for any test to determine fair-use. The 1994 amendment took away the general fair-use defense with regard to computer software otherwise available under Section (52) (1) (a).[34] The general fair-use defense permitted the free use of a work for 'private purposes, including research

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[31]   Art- 4 (c) of European Directive On the Legal Protection of Computer Programs, 91/250/EEC.
[32]   Art-6, TRIPS.
[33]   Section 31.
[34]   Section 52 (1) (a), "(1) the Following acts shall not constitute an infringement of copyright, namely:-
         a)   a fair dealing with a literary, dramatic, musical or artistic work not being a computer programme for the purpose of-
              (i)   private use, including research;
              (ii)   criticism or review, whether of that work or of any other work;

and criticism or review, whether of that work, or of any other work'. The denial of these two rights, namely, research and criticism, is inimical to the public interest. These rights were denied on the grounds that the general 'right to reproduce them for private use is not necessary in the interest of the bonafide users of computer programes'.[35] The provision *per se* prohibits the reproduction of a program by the purchaser even if it is for research and review. However, it gives the purchaser the right to make adaptations and back copies. However, the Act has curtailed the freedom of a researcher since he has to buy a copy for his research. Nevertheless, the impact of the Act would not be very drastic since exemption has been given to teachers, students and researchers in government and educational institutions.[36] However, private persons doing R&D will have to buy the program anew. Thus, the Act will adversely affect individual software development. The prohibition of copying for the purpose of criticism and review will effectively block the information about the performance of a program. This will control the consumer's right to get an objective assessment about program quality of the software options prevailing in the market.

The 1994 amendment added a new provision regarding fair dealing pertaining to computer software. It permits the lawful possessor of a software copy to make back copies or adaptations, but the use of the copies should be 'in order to utilize the computer program for the purpose for which it was supplied; or to make back copies purely as a temporary protection against loss, destruction or damage in order only to utilize the computer programme for the purpose for which it was supplied'.[37] Thus, the Act limits the fair use exemption by putting two conditions. Program adaptation is also restricted by quoting the above mentioned conditions. The first limitation i.e., the utilization of the program only for the purpose for

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[35]   The Copyright (Second Amendment) Bill, 1994. Section 52 (1) (a) and notes on cloause 17, p. 22.
        Supra note 14, p. 45.
[36]   Ibid.
[37]   Section 52 (1) (aa).

which it was supplied, is in effect a prohibition of all modes of reverse engineering except manual reading. This limitation further blocks the observation, study and test-run of a program so as to discern the ideas underlying the program. The hitch is that such a prohibition on software reverse engineering only helps the software giants to establish a legal monopoly in the market (in this case, the Indian software market). Moreover, it denies the domestic industry any chance to familiarise itself with the latest technological advancements and thus develop indigenous programs and gadgets that are in tune with the global technology. What the legal system in India is ignoring is that such rights, when enjoyed by certain software giants in the US, Europe and Japan, was thoroughly rebuked by the international software fraternity. In fact, this purpose oriented restriction was questioned in the *Valut Vs Quaid* (mentioned in the previous chapter). The denial of reverse engineering is also a denial of the legal recognition given to interoperability and compatibility of software. The provision also creates doubts as to whether the non-protection of interface specifications and user interfaces will be properly adhered to. Therefore, it can be said that this provision goes beyond the purpose of copyright protection by providing protection to the idea along with the expression. (It has to be understood that this endeavor to protect the idea is the domain of patent protection and not that of copyright protection).

The new amendment (1999) brought forth a few changes in the fair use provision pertaining to computer software. It added three new provisions in the Act in Section 52(1) (aa). The new provisions read:

> "(ab) the doing of any act necessary to obtain information essential for operating inter-operability of an independently created computer programme with other programmes by a lawful possessor of a computer programme provided that such information is not otherwise readily available;
>
> (ac) the observation, study or test of functioning of the computer programme in order to determine the ideas and principles which underline any elements of the programme while performing such

acts necessary for the functions for which the computer programme was supplied;

(ad) the making of copies or adaptation of the computer programme from a personally legally obtained copy for non-commercial personal use".[38]

Thus, the amendment permits decompilation or any other act required to achieve interoperability of an independently created computer program with other programs in the absence of the ready availability of such information. Further, it explicitly permits other modes of reverse engineering by permitting the observation, study or test of functioning of the computer program to determine the ideas and principles underlined in the program. But this freedom is limited by the words "while performing such acts necessary for the functions for which the computer programme was supplied".[39] Making of a copy from a legally obtained copy for a non-commercial purpose is also permitted by the new amendment. Thus, these changes would definitely dilute the present legal position regarding reverse engineering, compatibility and research.

However, a close examination of these provisions reveals that the dilution of the provisions is more apparent than real. The first problem arises with the explicit permission of 'any act' for achieving interoperability. The Bill uses the term 'any act' instead of 'decompilation' or 'disassembly'. This may, at the outset, appear as a wider term which includes not only decompilation and disassembly but also other modes of reverse engineering mentioned in Section 52 (1) (ac). However, the problem lies in the actual scope of such a provision. The new Amendment permits these 'acts' only for achieving interoperability. Thus, the scope of reverse engineering is restricted to achieving interoperability. This is akin to the provision given in the EC directive. Reverse engineering is not only required for interpretability but also for making a competing program. In the US,

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[38]   Section 7, The Copyright (Amendment) Bill 1999.
[39]   Section 52 (1) (ab).

the decompilation right is available to discern the idea of the program if that is the only way to understand the idea of the program. There is no valid reason to restrict the scope of a provision which can positively help the technological development of the domestic industry. Further, according to the new provision, reverse engineering can be resorted to only in a situation wherein such information is not otherwise readily available. Thus, the provision presupposes the party to first approach the owner of the copyright for the information required for inter-operability before opting for reverse engineering. In the absence of any clear definition, an information subjected to license fee may be interpreted as within the scope of 'information readily available'. In that case, one has to pay royalty to get the information about interfaces. This would mean that the provision which permits interoperability will become nothing but a show piece.

Further, the word "any act" in Section 52(ab) creates confusion regarding the different modes of reverse engineering except decompilation and disassembly. The word "any act" encompasses all forms of reverse engineering. Does it mean that other forms of reverse engineering other than decompilation and disassembly constitute a violation of fair use if it is put to use for any other purpose than interoperability. Even though Section 52 (ac) explicitly permits other modes of reverse engineering "while performing such acts necessary for the functions for which the computer program was supplied", it does not clarify the position. Moreover, it adds confusion because the above provision can be interpreted to mean as prohibiting use of those methods exclusively to discern ideas under line in a program. Lastly, confusion persists regarding the information gets from performing such acts under Section 52 (ac), whether, it can be used for interoperability even in the presence of readily available information. The Act does not provide any clue to these issues. One has to wait for the courts opinion for clarification.

After the *Sega* and *Atari* cases, the US law on decompilation did not impose any purpose oriented limitation. The only limitation was that, in the

absence of any other legitimate way it was possible to resort to decompilation. The European position regarding reverse engineering, except decompilation, is very clear in Article 5(3) EC Directive on Legal Protection for Computer Program. Decompilation is permissible only to achieve inter operability in the absence of ready availability of such information. But the strongest point in the European provision is that it prohibits any contractual restrictions on any mode of reverse engineering.

In India, though we follow a close analogue of the European Directive, we have failed to provide any provision against contractual restrictions. This makes our reverse engineering provision the weakest amongst the three. The envisaged invalidity of the Shrink Wrap agreement is not totally ensured. Moreover, other contractual restrictions can easily prevent the purchaser from reverse engineering. This is discussed elsewhere in this chapter.

There is no legal provision to extend protection to the interface specifications and user interfaces. However, the presence of an explicit provision for interoperability and the subsequent court judgments on the scope of Copyright protection show that the functional elements of a program are not protected in India. This will, however, lead to litigations contesting this norm.

The amendment permits the making of a copy for adaptation from a legally obtained copy for non-commercial use. The term 'non-commercial' is not defined. The purpose of the provision is to permit a person to keep a few copies with him. However, in the absence of the definition of non-commercial purpose, one can argue that such copies can be used for pure research.

II   PATENT

In India, a patentable invention means 'any new and useful- 1) act, process or manner of manufacture, 2) machine, apparatus or other article, 3) substance produced by manufacture- and includes any new and useful improvement of any

of them and an alleged invention.[40] This implies that a computer program would not qualify either as a process or as a manner of manufacture because it does not result in the production of a vendible product.[41] Computer software as such is neither a machine nor an apparatus or any other tangible article to have a new size, shape and function like the machines. It also cannot qualify as a substance produced by manufacture because-a software program can be written in many ways. Hence, it is not an article of manufacture. Section III of the Patent Act sets forth a list of inventions which are not patentable. Under Section III (c), a mere discovery of a scientific principle or the formulation of an abstract theory cannot be patented. Software program is infact on algorithm which precisely qualifies as an abstract theory. Therefore, it cannot be patented under the Indian Patent Act even in the absence of an express provision excluding computer programs from patentability.[42]

However, the practice shows that software related patents are indeed available in India. But the claimant should either effectively disguise the computer program in the form of a hardware claim or put it forth as a means-cum-function claim (i.e. it is a process closely connected with the hardware to produce a tangible result). In other words, the patent claim should possess a very visible physical element limitation.[43] This is clear when one peruses the format set down for a computer software claim to qualify for patenting in India. The format demands the following specifications: 'Data processing apparatus comprising- a first processor under the control of a first means operating under a first operating system; a second processor under the control of a second means operating under a second operating system, the second operating system providing the resource device services for the data processing apparatus characterised in that; an information

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40   Section 2 (j) of Indian Patents Act 1970.
41   Section 3 (c).
42   P. Naryanan, Patent Law, Eastern Law House, Calcutta, 1994, p. 24.
43   Pravin Anand, "The Impact of New Technology on the Patent System", Paper Presented on NASSCOM Seminar on Patent Protection of Computer Related Inventions, 17 Dec. 1998, New Delhi.

transfer device is coupled between the processors enabling the direct transfer of information between the first and second means without using the services of the operating system- where the first processor and the second processor are all physical elements'.[44]

Hence, it can be clearly discerned that software related patenting is a reality in India. However, the legal position on this issue is unclear, given the absence of a clear statutory provision or any court opinion with reference to any case pertaining to this issue. (No such case has so far come up in Indian courts). It shows that India is following the-US practice which started giving patents to means-cum-function claims and finally ended up in recognising software as an article of manufacture. More alarming are the current practices that are in vogue in the Patent office. A good attorney can easily disguise a mathematical algorithm through his drafting skills and can thus ensure a patent protection for the program. Such practices will affect the development of the domestic software industry.[45] Already, the Indian PC application market is virtually under the control of MNCs who have made a clever use of this legal shortcoming. Therefore, such a liberal patenting policy in India would help the MNCs to patent their so called 'inventions' in India. This would effectively block the dissemination of technological knowledge which is necessary for the adequate development of the domestic software industry especially when we are at the threshold of marketing software packages for mass consumption.

It is the lack of infrastructure of the patent office in terms of qualified examiners, prior-art data base etc that leads to this sorry state of affairs. This will result in bad patenting. It will also spur a flurry of litigations by the patent-owners alleging infringement.[46] This would definitely lead to a situation in which the

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[44]   Ibid.

[45]   K. Gopinath and M.K. Raivshankar, "Intellectual Property Rights in Computer Software: Issues at Stake for Developing Countries Vis a.Vis Dunkel Draft", *National Working Goup on Patent Laws*, New Delhi, 1993, p. 16

[46]   Brain Khain, "Software Patents", *Technology Review*, April 1990, pp. 53-58.

domestic industry will be economically impeded in that they will have to pay a license fee for even trivial technologies. What will result is a stagnancy in the growth of the industry. This will further result in the decrease of mass accesibility to new technology (Thus, it will be domestic consumer who will ultimately suffer). Moreover, it would block these technological innovations from being adapted to suit and cater to the local needs.[47] It will leave the small developers of software under heavy economic stress; not only in developing afresh the technological innovations but also in terms of securing IP protection for their own survival.

The argument for giving patent protection maintains that India has already established its presence in the world software industry. We also possess a large number of software professionals. By providing protection to their contributions we can not only block others from appropriating our inventions but also preempt the invention to be solely our right through patenting. (we may otherwise be pipped at the post for an invention that we have indigenously developed. The tragedy would be that if we fail to check a patent on an invention quite similar to ours we may end up facing infringement charges). However, this argument overrates the software technology capability of India. It has to be understood that in the case of value-added software products, we are far behind the world standards.

III   TRADE SECRET AND CONTRACT

In India, there is no comprehensive statute for the protection of trade secret. However, as a part of the common law tradition, remedies are available for the breach of confidential information and know how (both industrial and trade secret). The pertinent questions related to the IP protection of computer software in the Indian context is whether a shrink-wrap license is valid and whether a

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[47]   Supra Note 45, p. 16-17.

contractual restriction on reverse engineering is valid. In order to qualify for a trade-secret protection in India three conditions must be fulfilled. They are: '1) the subject matter is to be confidential but the confidentiality may not be absolute. 2) such confidential information should be passed on to others under conditions of confidentiality 3) the confidante in breach of the condition of confidentiality must have used such information to the detriment of the confider'.[48] Therefore, one can argue that a widely circulated product cannot be considered as confidential. Further, Section 16 of the Copyright Act prohibits the creation of any legal right equivalent to the right available as per the Copyright Act. Therefore, any clause in a licensing agreement which prohibits reverse engineering can be considered as invalid.[49] However, this view will not hold good in the light of the last line of same Section which reads "but nothing in this section shall be construed as abrogating any right or jurisdiction to restrain a breach of trust or confidence". Hence, the ultimate verdict is that of the court since there is an absence of a statutory provision.

In retrospect, any policy formulation on software IP protection should be based on the two basic premises namely, providing access to the masses and the facilitating the dissemination of technology to the domestic software industry. Therefore, the IP regime should be formulated in such a way that it will regulate the literal piracy and not the denial of technological exchanges within the software industry as a whole. If one examines the existing regime from this point of view, it will be obvious that the regime has fallen short of achieving these necessary goals. By attaching stringent rules for reverse engineering and then providing room for contractual restrictions the copyright protection, in effect, takes away even the

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48 P. Narayanan, Intellectual Property Law, Eastern Law House, Calcutta, 1998, pp. 323-27.
49 Section 16, No Copyright except as provided in this Act. No person shall be entitled to copyright of any similar right in any work, whether published or unpublished, otherwise than under and in accordance with the provisions of this Act of any other law for the time being inforce, but nothing in this section shall be construed as abrogating any right or jurisdiction to restrain a breach of trust or confidence.

permissible reverse engineering space. By doing so it blocks the dissemination of technology within the industry. It is exactly such information exchanges that a country like India needs at least in the initial stages of the establishment of the software industry. Moreover, by inserting the provision that a known-use of an infringed copy is a criminal offence,[50] the Copyright Act poses questions on human rights, individual freedom and public policy. It not only places a burden on the user but it also allows the software giants to resort to severe legal procedures alleging infringement. Thus, this provision, instead of creating a viable piracy-check mechanism, has grossly over reached its purpose. Its stands as a big brother who sets up an authoritarian copyright regime.[51]

A patent policy which liberally grants patents to software, that too in a post TRIPS era, is capable of blocking technological knowledge from being exchanged. At present, the policy of the patent office is not favouring the patentiblity of software *per se*. However, in the absence of any statutory prohibition, the interpretation can be changed in such way so that it favours the patentability of software *per se*. As far as trade secret and contract protection are concerned, the legal position is not yet clear. This may give room for software giants to pursue their anti-competitive practices which is inimical to both consumers and the domestic industry.

Therefore, our IP regime pertaining to software should safeguard the above mentioned interests of the industry and the public. In doing so, the only constraints

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[50]   Section 63 B, "Knowing use of infringing copy of computer programme to be an offence. Any person who knowingly makes use on a computer of an infringing copy of a computer programme shall be punishable with imprisonment for a term which shall not be less than seven days but which may extent to three years and with fine which shall not be less than fifty thousand rupees but which may extend to two lakh rupees.:
    Provided that where the computer programme 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 judgement, not impose any sentence of imprisonment and may impose a fine which may extend to fifty thousand rupees".

[51]   In Philippines, a similar provision was used by the police to conduct raids in many educational institutions and commercial shops to seize the alleged pirated versions installed in the PCs. Source: Roberto Verzola, "Globalization: The Third World", Paper Presented at *International Conference on Colonialism and Globalization*, Feb. 1998, New Delhi.

are the ones that emanate from the various treaty obligations pertaining to the intellectual property protection. Hence, the Indian legislation should find a balance between international obligations and domestic concerns. The options available for such a balancing act will be discussed in the next chapter.

CHAPTER-IV

Finding The Balance:
Indian Laws and
International Standards

CHAPTER IV

FINDING THE BALANCE: INDIAN LAWS AND INTERNATIONAL STANDARDS

The international initiative to protect computer programs was started by WIPO in the late 70s. It was based on the WIPO working group report (1979) on the copyright problems arising from the use of computer.[1] WIPO also conducted a survey concerning the desirability and feasibility of a treaty for the protection of computer software.[2] This initiative was followed by the preparation of a draft treaty for the protection of computer software.[3] To discuss the draft treaty, WIPO organised an expert committee meeting in Geneva in 1983.[4] Then, the WIPO's focus was to bring about a *Sui-Generis* protection to computer software. However, after the US decision to extend copyright protection to computer software, this proposal for a *Sui-Generis* protection was rejected by the developed countries.[5] Subsequently, there was an expert committee meeting in 1985 to discuss the copyright aspects of computer software (jointly organised by UNESCO and WIPO) This time the focus had clearly shifted from *Sui-Generis* protection to copyright protection.[6] Again, the initiative within WIPO gained momentum in 1989 when attempts were started to conclude a protocol to the Berne Convention without engaging in a full revision of the convention.[7] This process culminated in the adoption of the WIPO Copyright Treaty in 1996.

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[1]   Daneal J Gervois, "The Protection under International Copyright Law of Works Created with or by Computers", *IIC*, Vol. 23, 1991, p.646.

[2]   WIPO, *Report on Committee of Experts On the Legal Protection of Computer Software*, June 13-17, 1983, Doc. LPCS/II/6, p.2.

[3]   WIPO, *Draft Treaty for the Protection of Computer Software*, Doc. LPCS/II/3. Also see the report on Committee Meeting, *Journal of World Trade Law*, vol.17, 1983, pp.537-545.

[4]   Supra note 2.

[5]   UNESCO-WIPO, *Group of Experts on the Copyright Accepts of the Protection of Computer Software*, Geneva, February 25 to March 1, 1985, Doc. UNESCO/WIPO/GE/CCS/3.

[6]   Ibid.

[7]   WIPO, Committee of Experts on a possible protocol to the Berne Convention for the Protection of Literary and Artistic Work, Memorandum on Questions concerning to a possible protocol to the Berne Convention Part-I, Doc. BCP/CE/1/2.

Around the same time, the Uruguay GATT round of trade negotiations took up the issue of trade related aspects of intellectual property rights (TRIPS) and concluded the TRIPS Agreement in 1994. The protection of computer software found a place in the TRIPS Agreement. The WIPO Copyright Treaty adopted provisions which were in line with the TRIPS agreement.[8] Thus, the protection of computer software is explicitly mentioned in the international copyright treaties. Other than this software did not find an explicit mention in any of the international intellectual property rights treaties for patent and trade secret protection. This chapter discusses the international standards established by international treaties namely, Berne Convention, TRIPS Agreement, WIPO Copyright Treaty and Paris Convention vis-a-vis the Indian Law.

I   COPYRIGHT

The International Copyright Regime was in a perplexed situation in the late 1980's, with two international conventions, namely Universal Copyright Convention(UCC) and the Berne Convention claiming preeminence for regulating international copyright.[9] The former was administered by the UNESCO and the latter was under the auspices of the World Intellectual Property Organisation (WIPO). However, later developments like the accession of US to the Berne Convention[10] and the recognition accorded to it through the TRIPS agreement,[11] made the Berne Conventions the primary legal instrument for the regulation of International Copyright Regime.

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[8]   During the meeting of Committees it was decided to discuss the issue in the background of TRIPS because many items on the agenda of the expert committee was already found place in TRIPS. See *Reports of Committee of Experts on possible protocol to Berne Convention*, Doc. BCP/CE/IV/2, BCP/CE/IV/3.

[9]   Anthony D Amoto and Doris Estelle Long (eds) International Intellectual Property Law, Kulwer Law International, the Hauge, 1997, pp. 258-68.

[10]   Ibid., p. 259.

[11]   Article 9 one of the TRIPS reads: 1. Members shall comply with Articles 1 through 21 of the Berne Convention (1971) and the Appendix thereto. However, Members shall not have rights or obligations under this Agreement in respect of the rights conferred under Article 6bis of that Convention or of the rights derived therefrom.

The Berne Convention was established in 1886 and remained essentially a European club till the early 50s. The Convention was subsequently amended three times.[12] The present version of the Convention is the 1971 amended version. The Berne Convention prescribes a minimum condition for each party to adhere to, namely, primary, exclusive rights, terms of protection etc. It also lays down the terms of national treatment.[13] However, the Berne Convention is silent about computer software. TRIPS is the first international legal instrument which contains an explicit provision for the protection of computer programs. Till the conclusion of TRIPS, the protection of computer software at the international level was a doubtful proposition. However, an attempt to include computer programs along with other issues like data base, rental rights, non-voluntary license for the recording of work, non-voluntary license for primary broadcasting and satellite communication, distribution rights, duration of protection of photographic work, communication to the public by satellite broadcasting, enforcement of rights etc in the form of a protocol, was initiated in the Berne Convention in 1989.[14] As a result, the WIPO convened a diplomatic conference in 1996 to conclude three treaties.[15] The conference finally adopted two treaties namely, WIPO Copyright Treaty (Copyright Treaty) and WIPO Phonogram Treaty (Phonogram Treaty). Thus, there are three treaties relevant to the software IP protection namely, the Berne Convention, the TRIPS agreement and the WIPO Copyright Treaty. India

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[12]   Supra note 9, p. 262-264. After the unsuccessful attempt to revise the convention in 1908 (Berlin Conference) and 1928 (Rome Conference) it was amended in 1948 (Brussels Conference) 1967 (Stockholm conference) and 1971 (Paris Conference).

[13]   Article 5(1) of the Berne Convention reads: Authors shall enjoy, in respect of works for which they are protected under this Convention, in countries of the Union other than the country of origin, the rights which their respective laws do now or may hereafter grant to their nationals, as well as the rights specially granted by this Convention.

[14]   Derothy Shrader, "World Intellectual Property Organization Copyright Treaty: An overview", Congressional Research Paper, The Library of Congress, 1997, p. 4.

[15]   CRNR/DC/4, "Basic proposal for the substantive provisions of the treaty on certain questions concerning the protection of literary and artistic work". CRNR/DC/5, "Basic proposal for the substantive provisions of the treaty for the protection of the rights of performers and produces of phonograms" and CRNR/DC/6, "Basic proposal for the substantive provisions of the treaty on intellectual property in respect of Databases". Quoted by N.S. Gopalakrishnan Infra note 35 p. 3.

is a party to only two - Berne Convention and TRIPS.[16] However, the government is considering the ratification of the Copyright Treaty. Therefore, the discussion that will follow will be in the light of all these three conventions.

As stated earlier, the Berne Convention does not have any special provision for computer software protection. But, the Berne Convention is important due to the adherence of TRIPS. Article 9 of TRIPS makes the signatories *ipso facto* members of the Berne Convention.[17] The same article further excludes any protection to ideas, procedures, methods of operation, mathematical concepts etc from the domain of copyright[18] Regarding computer software, TRIPS requires the signatories to protect the computer program whether in source or object code as a literary work under the Berne Convention.[19] It further extends rental rights to computer programs with an exemption for 'rentals where the program itself is not the essential object of the rental'.[20] The minimum term of protection for the program *per se* is fixed at 50 yrs.[21] Further, the members shall confine their limitations or exceptions to exclusive right to certain special cases which do not conflict with the normal exploitation of that work and do not prejudice the

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[16] India is party to the following international conventions on copyright and neighboring rights.
- Berne Convention for the Protection of Literary and Artistic Works since 1 April 1928.
- Universal Copyright Convention (UCC), under the auspices of UNESCO, since 20 October 1957.
- Convention for the Protection of Producers of Phonograms against unauthorized Duplication of their Phonograms, since 12 February 1975.
- Multilateral convention for the Avoidance of Double Taxation of Copyright Royalties and Additional Protocol, since 31 October 1983, with some reservations.

The other intellectual property rights to India acceded are: the Paris Convention, the Patent Corporation Treaty and Trade Related Aspects of Intellectual Property Rights.

[17] Supra note 11.
[18] Ibid.
[19] Article 10(1) of the TRIPS reads: Computer programs, whether in source or object code, shall be protected as literary works under the Berne Convention (1971).
[20] Article 11.
[21] Article 12 of TRIPS reads: "Whenever the term of protection of a work, other than a photographic work or a work of applied art, is calculated on a basis other than the life of a natural person, such term shall be no less than 50 years from the end of the calendar year of authorized publication, or failing such authorized publications within 50 years from the making of the work, 50 years from the end of the calendar year of making".

legitimate interest of the right holder.[22] The exclusive right for a software author, therefore, falls under the TRIPS, in accordance with the Berne Convention.

The WIPO Copyright Treaty also explicitly provides protection for computer software. As in TRIPS, the parties to this treaty are also *ipso facto* to adhere to article 1-20 of the Berne Convention.[23] It requires the parties to protect the computer software as a literary work within the meaning of article 2 of the Berne Convention irrespective of the mode or form of their expression.[24] Further, the protection under Article 4 extends to only expression and not to ideas, procedures, methods or operations or mathematical concepts as such.[25] Again, the scope of protection of computer programs is on a par with the relevant provisions of the TRIPS agreement.[26] Like TRIPS, it recognises the right of rental[27] and the right of distribution[28] of the author. Under this Convention, the signatories right to set up certain limitations and exceptions to the right of the author is limited by stating that such limitations should not conflict with the normal exploitation of the work and do not prejudice the legitimate interest of the author.[29] New innovations

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[22] Article 13 of the TRIPS reads: Members shall confine limitations or exceptions to excessive to certain special cases which do not conflict with a normal exploitation of the work and do not unreasonably prejudice the legitimate interests to the right holder.

[23] Article 1 of WIPO Copyright Treaty reads: This Treaty is a special agreement within the meaning of Article 20 of the Berne convention for the Protection of Literary and Artistic Works, as regards Contracting Parties that are countries of the Union established by that Convention. This Treaty shall not have any connection with treaties other than the Berne Convention, nor shall it prejudice any rights and obligations under any other treaties.

[24] Article 4 of the Copyright Treaty reads: Computer programs are protected as literary works within the meaning of Article 2 of the Berne Convention. Such protection applies to computer programs, whatever may be the mode or form of their expression.

[25] Article 2 of the Copyright Treaty.

[26] Agreed statement concerning Article 4 of Copyright Treaty reads: The scope of protection for computer programs under Article 4 of this Treaty, reads with Article 2, is consistent with Article 2 of the Berne Convention and on a par with the relevant provisions of the TRIPS Agreement.

[27] Article 7 of the Copyright Treaty of reads: 1. Authors of (i) computer programs;
(ii) cinematographic works; and
(iii) works embodied in phonograms, as determined in the national law of Contracting Parties, shall enjoy the exclusive right of authorizing commercial rental to the public of the originals or copies of their works.
2. Paragraph (1) shall not apply
(i) in the case of computer programs, where the program itself is not the essential object of the rental...

[28] Article 6 of copyright Treaty.

[29] Article 10 Ibid.

were done with regard to legal protection and effective legal remedies against the circumvention of effective technological measures (i.e. protection against devices or services that defeat anti-copying technologies) and obligation concerning Rights Mangements Information.[30] The rest of the discussion in this chapter will examine the obligation of India under the above mentioned treaties vis-à-vis the Indian Copyright Act regarding the copyright protection of computer software.

Interface

The TRIPS, as well as, the Copyright Treaty explicitly make it clear that copyright protection under these treaties does not extend to ideas but only to the expression. Also excluded are procedures, methods of operation and mathematical operations.[31] Therefore, it is clear that the scope of protection for computer software under these treaties extend only to the literal elements and not to the non-literal elements.[32] That is to say, interface specifications including user interfaces are not protected either in TRIPS or under the Copyright Treaty. Hence, one member country can explicitly classify these interfaces as being outside that copyright domain. Here, one should be very careful while making exemptions to interface copyright regulations because the exemption of interfaces as an idea would result in the idea-expression dichotomy doctrine.[33] This would be subjected to a case-to-case legal hearing and would result in unnecessary litigations. Therefore, appreciating interfaces as a procedure or as a method of operation for the exemption from copyright protection would be a more pragmatic approach.

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30   Article 11 and Article 12 Ibid.   -
31   Article 2 of Copyright Treaty and Article 9(2) of TRIPS.
32   Siehnai F. Willliamson, "The International Enforcement of Software Copyright and Patents", *Computer Law Review and Technology Journal*, Winter 1998, p.80.
33   Article 1(2) of EC Directive Reads: Protection in accordance with this Directive shall apply to the expression in any form of a computer program. Ideas and principles which underlie any element of a computer program, including those which underlie its interfaces, are not protected by copyright under this Directive.

The Indian Copyright Act is silent about the protection of interfaces. As of today, the only exclusion possible is under the idea-expression dichotomy.[34] By providing an explicit exemption to interfaces from copyright, one can avoid unnecessary litigation.[35] It also frees the individual as well as small-scale software developers from the threat of litigation from the software giants.

Reverse Engineering

As stated earlier, the protection of computer software under TRIPS and the Copyright Treaty never went beyond expression.[36] The only obligation under these treaties was to ensure the protection of a program as a whole. Further, the treaties permit the signatories to limit the exclusive right of the author of the protected work.[37] In the absence of any obligation to protect the underlying technical ideas encompassed in a software, the program can be reverse engineered.[38] Moreover, there is no limitation regarding the scope of reverse engineering. That is to say, even though wholesale copying of a computer program is prohibited, "the practice of re-implementing the functional components of a protected program in clones is not prohibited".[39] Thus, an independently developed program which performs the same function as that of the earlier program does not infringe the copyright. In other words, one can reverse engineer a program for any purpose.

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[34] There is neither Statutory provision, similar to the EC Directive nor any specific case law. Therefore one has to relay on general case law on scope of Copyright protection. For instance, R.G. Anand V. Deluxe Film, AIR (1978) SC 1613

[35] N.S. Gopalakrishnan, "WIPO Copyright and Performers and Phonogram Treaties – Implications for India", The Academy Law Review, vol.21, 1997, p.34.

[36] Supra note 31.

[37] Article 9(2) and 10 of the Berne Convention, Article 10 of TRIPS, Article 13, Article 10 of Copyright Convention.

[38] Mastin D.H. Woodward, "TRIPS and NAFTA's Chapter 17: How will Trade-Related Multilateral Agreement Affect International Copyright?", Texas International Law Journal, Vol..31, 1996, p.276.

[39] UNCTAD, The TRIPS and Developing Countries, UN, New York, 1996, p.40.

Hence, limiting the reverse engineering process only for the achieving of interoperability is a broad interpretation of the treaty provisions.[40] The correct perspective, therefore, would be that the protection is against wholesale copying. Broad scope for reverse engineering would promote competition and also help in the expansion of 'opportunities of firms in developing countries to develop substitutes or interoperable programs and to enhance their participation in the world market'.[41] Therefore, a national legislation can provide all methods of reverse engineering, including decompilation/disassembly as legitimate practices which will help to develop interoperable as well as competing programs.[42] Limiting the reverse engineering only for achieving interoperability is, therefore, unwarranted as it retards competition as well as the dissemination of technology within the domestic industry. The present Indian Act has to be amended so as to do away with this over protective norm.

Fair Use

TRIPS and the Copyright Treaty also permit the reasonable limitation to the scope of exclusive right in the public interest. Thus, the fair-use provision is permissible under all the three treaties.[43] The Copyright Convention's agreed statement made it clear that the scope of the Berne Convention provisions would be applicable for the fair use limitation under the Treaty.[44]

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[40] Section 52 (1) (a b) of the Indian Copyright Act (as amended now) reads: "the doing of any act necessary to obtain information essential for operating inter-operability of an independently created computer program with other programs by a lawful possessor of a computer program provided that such information is not otherwise readability available...." Article 6 (1) of EC Directive limits Decomplilation rights only for interoperability it reads: The authorisation of the rightholder shall not be required where reproduction of the code and translation of its form within the meaning of Article 4(a) and (b) are indispensable to obtain the information necessary to achieve the interoperability of an independently created computer program with other programs....

[41] Supra note 39, p.39.

[42] South Centre, The TRIPS Agreement A Guide for the South, Geneva, 1997, p.73.

[43] Article 9(2) of the Berne convention, Article 13 of TRIPS, Article 10 of Copyright Treaty.

[44] Agreed statement concerning Article 10 of Copyright Treaty reads: "It is understood that the provision of Article 10 permit Contracting Parties to carry forward and appropriately extend into the digital environment limitations and exceptions in their national laws which have been considered acceptable under Berne Convention. Similarly, these provisions should be understood to permit Contracting Parties to devise new exceptions and limitations that are appropriate in the

In short, there is no special limitation to general fair use doctrine with regard to computer software. Since no provision in any of these treaties prohibit the reproduction of a computer program for teaching, or study or research or criticism, the fair-use exemption of the computer program under the Indian Copyright Act is again unwarranted.[45] Such a provision is in fact required to develop a human resource for including the needs for the growing domestic industry.[46]

Also, these treaties are silent with respect to the making of copies by a legitimate user for the purpose of back up copies and adaptation. Therefore, in implementing the TRIPS agreement, with regard to the legitimate copies of a computer program, the national legislation may provide that the legitimate user may make one or more backup copies as well as any adaptation required for the user's private use.[47] In line with the above interpretation, the Indian Copyright Act permits the user to adapt as well as make back up copies.[48]

The fair-use exemption also permits the exemption of certain other uses of computer program that otherwise constitute copyright infringement. According to the Indian Copyright Act, a temporary loading of a program into a computer's Read Only Memory (ROM) constitutes an infringement.[49] This temporary

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[45] digital network environment. It is also understood that Article 10(2) neither reduces nor extends the scope of applicability of the limitations and exceptions permitted by the Berne Convention.
Section 52 (1)(a) of the Indian Copyright Act : "a fair dealing with a literary, dramatic, musical or artistic work not being a computer program for the purpose of (i) private ure, including research; (ii) criticism or review, whether of what or of any other work". Also see, Supra Note 35, p.23.

[46] The Core Group on Amendments to the Copyright Act, 1957, proposed a provision to except coping of program for academic purpose. It reads: " making of copies or adaptation of a computer program from a legally obtained copy by teacher or a pupil in the course of instruction, study or research". Discussion paper for the second meeting of the Core group on Amendment to the Copyright Act, 1957, dated July 12 1999.
According to NASSCOM Survey in 1995 the demand for System Analysis, Software Engineers and project managers were 16000, 2400 and 1400. But the supply of 6000, 30 and 1000. Also see, Rajiv Benjwal, India's Software Industry an Assessment, M.Phil Dissertation submitted to the JNU, 1998.

[47] Supra note 43, p. 73.

[48] Section 52 (1) (ad) of Indian Copyright Act reads: "the making of copies or adaptation of the computer program from a personally legally obtained copy for non-commercial personal use."

[49] Section 2 (m) of Copyright Act reads: "infringing copy means, in relation to a literary, dramatic, musical or artistic work, a reproduction thereof otherwise than in the form of a cinematorgraph film; in relation to a cinematographic film, a copy of the film made on any medium by any means;

reproduction is required for the servicing of the computer. Therefore, such an exemption, which is now available in the US,[50] should be made available in India too.

Distribution Rights

The main debate related to the right of distribution is regarding the scope of the application of exhaustion doctrine. The major issue is concerning the national, regional and international exhaustion of the public distribution right. The acceptance of the international exhaustion doctrine would cease the exclusive right on a particular copy immediately after its public distribution in any international market. On the other hand, the national exhaustion doctrine would limit the exhaustion only after its introduction in the national market. Thus, the national exhaustion doctrine gives the right holder the right to import the copyrighted work.[51] International exhaustion doctrine, however, permits parallel importing.[52] According to the Berne Convention, the signatories can limit the application of distribution rights through proper legislation.[53] Further, the TRIPS Convention clearly allows parallel import.[54] The Copyright Treaty also gives the members the freedom to choose any of three doctrines viz. national, regional and international.[55]

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[50] in relation to a sound recording, made by any means embodying the same sound recording, made by any means; in relation to a program or performance in which such a broadcast reproduction right or a performer's right subsists under the provisions of this Act, the sound recording or a cinematographic film of such program or performance, if such production, copy or sound recording is made or imported in contravention of the provisions of this Act". Also see infra note 60.

[50] Title III of the Digital Millenium Copyright Act enacts the "Computer Maintenance competition Assurance Act," which amends Section 117 of title 17 USC Section 117 contains certain limitations on copyright liability relating to maintenance or repair of computers by independent service organisations. The Act overturns a decision of the Ninth Circuit holding that an independent computer service-repair computer infringes the copyright in a computer program by causing reproduction of the program through activation of the computer, in the course of maintenance or repair work, Derothy Schrader, Digital Millennium Copyright Act, P.L. 105-304: Summary and Analysis, Congressional Research Paper, The Library of Congress, November 10, 1998, pp.14-15.

[51] Supra note 35, p.6.

[52] Ibid.

[53] Article 9(2) of the Berne Convention.

However, the Indian legal position is unclear in this regard. There is no statutory provision permitting parallel import. In the case of computer software, the copyright owner has an exclusive right for sale.[56] The only reported decision was in the Delhi High Court in *Penguin Books Ltd. England Vs Messrs. India Book Distributors.*[57] The court denied the legitimacy of parallel importing. In this case, the plaintiff (Penguin) had given the distribution licence to the defendant to import books from England. Contrary to the agreement, the defendant imported books from the US. By relying on the meaning of publication and also the definition of infringed copies, it was argued that the exclusive right of reproduction and publication includes the right to prohibit a person from importing and selling legally obtained copies from a country not specified in the distribution licence. The court accepted this argument and held that:

> "while publication generally refers to the issue to public, importation for the specified purpose may be a necessary step in the process of issuing to the public, and therefore of publishing. It appears that the exclusive right of Penguin to print, publish and sell these titles in India would extend to the exclusive right to import copies into India for the purpose of selling or by way of trade offering or exposing for sale the books in question".[58]

The court rejected the defendant's argument that importation of a lawfully published work is not an infringement under section 51 of the Copyright Act. The court stated that

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[54]   Article (6) of the TRIPS reads: "For the purposes of dispute settlement under this Agreement, subject to the provision of Article 3 and 4 nothing in this Agreement shall be used to address the issue of the exhaustion of intellectual property rights."

[55]   Article 6 of Copyright Treaty reads: "1) Authors of literary and artistic works shall enjoy the exclusive right of authorizing the making available to the pubic of the original and copies of their works through sale or other transfer of ownership. 2) Nothing in this Treaty shall affect the freedom of Contracting Parties to determine the conditions, if any, under which the exhaustion of ownership of the original or a copy of the work with the authorization of the author."

[56]   Section 14 (b) of the Copyright Act.

[57]   AIR (1985) Delhi-29.

[58]   Ibid., p.37.

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"it is also an infringement of Copyright knowingly to import into India for sale or hire infringing copies of a work without the consent of the owner of the copyright, though they may have been made by or with the consent of the owner of the copyright in the place where they were made. In America the subject books were lawfully published, it is true. But they cannot cross the borders of India without infringing the copyright of the exclusive licensee".[59]

Here, the court failed to appreciate the monopoly effect on the market while prohibiting parallel import. Later, this decision was set aside by the Supreme Court by consent.[60]

The parallel import is seen to be a policy issue. Therefore, it should be addressed by the legislature rather than leave it to the courts. The failure to do so would result in decisions akin to the *Penguin case* decisions mentioned above. Therefore, an amendment to provide legality to parallel import is necessary.[61]

Rental Rights

Both TRIPS and the Copyright Treaty extend exclusive right on commercial rental of the computer program.[62] The only exemption under this provision is that this right would not apply if the program itself is not the primary/essential object of the rental. The Indian Act, through its recent amendment, adopted this provision.[63] It also limited the exclusive right to commercial rental. Thus, we see that the Indian law has made itself adequately compatible to tackle issues concerning rental rights.

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[59] Ibid., p.
[60] Pravin Anand, written response to Questionnaire in Seminar on *Software Business and Intellectual Property Issues in Asia-Software Development Agreements and Exclusive Distribution Agreements*, Organized by Software Information Centre, Japan on December 1-2, Tokyo, 1998.
[61] Supra note 35, p. 10.
[62] Article 11 of TRIPS and Article 7 of Cooperative Treaty.
[63] Season 14(b) (ii) of Copyright Act now reads: "to sell or give on commercial rental or offer for sale or for commercial rental any copy of the computer program. Provided that such commercial rental does not apply in respect of computer programs where the program itself is not the essential object of the rental.

Protection against circumvention of anticopying technology

According to the Copyright Treaty, the contracting parties are placed under obligation to provide adequate legal protection and effective legal remedies against the circumvention of effective technological measures that are used by the authors to prevent copying.[64] However, both TRIPS and the Berne Convention are silent on this issue. The Copyright Treaty gives the contracting parties the space to provide appropriate provisions in their national legislations.

India has not yet ratified the Copyright Treaty. Therefore, it is not obliged to legislate any provisions on the lines of this treaty. In case of a future ratification, India has to make appropriate provisions to address the issue of circumvention of technological measures. There is a view that the existing provisions under the Indian Copyright Act is adequate to address this issue.[65] According to this view, Sections 65[66] and 66[67] provide criminal remedies against persons possessing plates for the purpose of making infringing copies. The definition of 'plate' includes the term 'other device' used or intended to be used

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[64]   Article 11 of Copyright Treaty reads: Contracting Parties shall 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 this Treaty or the Berne Convention and that restrict acts, in respect of their works, which are not authorized by the authors concerned or permitted by law.

[65]   Supra note 35, pp. 24-25. Also see supra note 60 it argues in a different way: "infringement of copyright is narrowly defined in section 51 read along with section 14 of the Act. It does not cover the activity of defeating a copy protection device. However, it may be contributory infringement or abetment. Section 40 of The Indian Penal Code, 1860 defines offences to not only cover offences defined under that enactment, but also in certain cases, offences under any special or local law. When the word offence is used in Section 109 (a provision relating to abetment of offences) of the Penal Code, it includes offences under any special law such as Copyright Law in this case. Therefore the act of defeating a copy protection device would constitute abetment, having the same punishment as copyright infringement".

[66]   Section 65 reads: "any person who knowingly makes, or has in his possession, any plate for the purpose of making infringing copies of any work in which copyright subsists shall be punishable with imprisonment which may extend to two years and shall also be liable to fine.

[67]   Section 66 reads: "the court trying any offence under this Act may, whether the alleged offender is convicted or not, order that all copies of all copies of the work or all plates in the possession of the alleged offender, which appear to be infringing copies, or plates for the purpose of making infringing copies, be delivered up to the owner of the copyright.

for reproducing copies of any work.[68] It is therefore argued that this definition along with section 65 and 66 provides remedies against circumvention of anti-copying technologies. Such an interpretation would result in a blanket prohibition on the circumvention of all kinds of technologies. This would lead to a prohibition of technologies with dual use as well as the existing legally permissible copying i.e. interoperability, reverse engineering and other fair-use practices. Such a prohibition is also seen to be contrary to the norms of public policy as it would curb the access to the ideas underlying in a program. Therefore, the Indian Act should have certain explicit exemptions when it is amended to incorporate this issue of circumvention of technological measures as provided in the US Digital Millenium Copyright Act.[69]

From the above discussion it clearly ensues that the International Copyright Regime pertaining to computer software seems to provide enough space to safeguard the interest of the developing countries. In the absence of any explicit provision, the international regime gives room for varying interpretations to the issues at hand. At the same time, there is indeed a possibility that those provisions given by the national copyright laws which provide light protection may be challenged before the dispute settlement body of the WTO.[70] In such a situation the country which challenges the national law would fall back on article 13 of the TRIPS agreement, saying that the challenged provision conflicts with the article

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[68] Section 2(t) reads: "plate includes any stereotype or other plate, stone, block, mould, matrix, transfer, negative, duplicating equipment or other device used or intended to be used for printing or reproducing copies of any work, and any matrix or other appliance by which should recording for the acoustic presentation of the work are or are intended to be make".

[69] Section 1201(c) of Digital Millennium Copyright Act provide the following exemptions: (1) affect fair use or any other existing limitations on copyright infringement or the existing rights and remedies of the Copyright Act; (2) enlarge or diminish the existing doctrines of vicarious or contributory copyright infringement; (3) obligate electronics-computer manufacturers to design consumer products to achieve products to achieve protection against circumvention so long as the products or parts do not otherwise fall within the ban of Section 1201 (a) (2) (b) (1); or (4) enlarge or diminish free speech or press rights for activities using consumer electronics, telecommunications, or computer products.
Circumvention for purposes of achieving interoperability of computers and reverse engineering by persons with access to a lawful copy are generally permissible under Section 1201(f), unless the activities otherwise copyright infringement.

[70] Article 64 of TRIPS.

13, which obligates the contracting parties 'to confine limitations or exception to exclusive rights to certain special cases which do not conflict with the normal exploitation of the work and do not unreasonably prejudice the legitimate interest of the right holder'.[71] In response to this argument, the defendant country can invoke article 9(2) which states that 'copyright protection shall extend to expressions and not to ideas, procedures, methods of operation or mathematical concepts as such.'[72]. Further, it can fall back on article 7[73] and 8[74] which states the objectives and principles of the TRIPS agreement and permits the contracting parties to take steps for the promotion of technological innovations and for the transfer and dissemination of technology and to promote the public interest in sectors of vital importance to their socio-economic and technological development.

II   PATENTS

Any discussion on India's international obligation to the patentability of software starts from the Paris Convention and the TRIPS agreement.[75] The right question to be asked in this context is whether these documents contain any compulsory provisions for software patenting.

Unlike the TRIPS agreement, the Paris Convention does not contain any specific provision for the scope of patentability. It lies within the purview of each contracting party. Therefore, it was concluded that 'there was no obligation under the Paris Convention to grant patents for computer software and all depended on

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[71]   Article 13 of TRIPS.
[72]   Article 9 (2) of TRIPS.
[73]   Article 7 of TRIPS reads: the protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conductive to social and economic welfare, and to a balance of rights and obligations".
[74]   Article 8 (1) of TRIPS reads: "Members may, in formulating or amending their law and regulations, adopt measures necessary to protect public and nutrition, and to promote the public interest in sectors of vital importance to their socio-economic and technological development, provided that such measures are consistent with the provisions of this Agreement.
[75]   Supra note 16.

the interpretation given, under the existing laws, as to whether a particular software was a patentable invention'.[76]

Even though the TRIPS agreement prescribes the minimum conditions for patentability, it does not have any explicit provision for software patentability.[77] However, the clause that 'a patent shall be available for any invention , whether products or process, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application'[78] may be interpreted as an endorsement of software patentability. On the other hand, the TRIPS agreement clearly provides copyright protection for software. Therefore, the above argument does not hold ground.[79]

A blanket ban on software patenting, if taken to the dispute settlement body may be challenged on the ground that it conflicts with article 27, which obligates the contracting parties to give patents on inventions in all fields of technology and which are capable of industrial application.[80] TRIPS also prohibits any field specific exclusion of patents.[81] Moreover, it can also be justified on the basis of Article I of the Paris Convention which states that 'patents should be understood in the broadest sense'.[82] This argument if appreciated in its essence may result in the granting of patents to software related invention with strong physical

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[76]   WIPO, *Committee of Experts on the Legal Protection of Computer Software*, Second Session, 1983, Doc. LPCS/II/6, p. 2.

[77]   Article 27(1) of TRIPS reads: Subject to the provisions of paragraphs 2 and 3, patents shall be available for any inventions. Whether products or process, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application. Subject to paragraph 4 of Article 65. paragraph 8 of Article 70 and paragraph 3 of this Article, patents shall be available and patent rights enjoyable without discrimination as to the place of invention, the field of technology and whether products are imported or locally produced".

[78]   Ibid.

[79]   Supra note 32.

[80]   Charles R. Mcmanis, "Taking TRIPS on the Information Super Highway: International Intellectual Property Protection and Emerging Computer Technology" *Villanova Law Review*, Vol.-41, winter, 1996, p. 247.

[81]   J.H. Reichman, "Implications of the Draft TRIPS Agreement For Developing Countries as Competitors in an Integrated World Market", *UNCTAD Discussion Paper*, No. 73, Nov. 1993, p. 13.

[82]   Article 1(3) of Paris Convention reads: "Industrial property shall be understood in the broadest sense and shall apply not only to industry and commerce proper, but likewise to agricultural and extractive industries and to all manufactured or natural products, for example, wines, grain, tobacco leaf, fruit, cattle, minerals, mineral waters, beer, flowers, and flour.

limitations.[83] However, in the absence of any explicit provision in any of the international agreements, the chance of patenting for software *per se* is very bleak (this bleakness was formally recognised by WIPO in 1992).[84] Perhaps one can conclude that "TRIPS agreement leaves both developed and developing countries free to determine the level of protection to be afforded program related inventions within their respective jurisdictions but not free to impose their individual decision on other member countries".[85] The reason for this omission may be due to the unprepardness "to deal with the difficulties that this subject matter has engendered everywhere also means that it provides no statutory basis for overcoming the formidable obstacles to patentability that have at times been reveled in most of the developed countries".[86] Therefore, a contracting party has to explicitly prohibit the patenting of software per se.[87]

III   TRADE SECRET

The TRIPS agreement is the first international convention which expressly obligates the contracting parties to protect undisclosed information. Any failure in doing so constitutes a violation of the obligation, made mandatory by the Paris Convention, to check unfair competition.[88] This can in turn be enforced by the

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[83]   Supra note 81.
[84]   Supra note 76.
[85]   Supra note 81.
[86]   Ibid.
[87]   Article 52(2) of the European Patent Convention lists the following are non-patentable subject matter: (i) discoveries, scientific theories and mathematical methods; (ii) aesthetic creations; (iii) schemes, rules and methods for performing mental acts playing games or doing business, and programs for computers; and (iv) presentations of information.
[88]   Article 39(1) TRIPS,
Article 10bis (Unfair Competition)
"1.   The countries of the Union are bound to assure to nationals of such countries effective against unfair competition.
2.   Any act of competition contrary to honest practices inn industrial or commercial matters constitutes an act of unfair competition.
3.   The following in particular shall be prohibited:
(i)   all acts of such a nature as to create confusion by any means whatever with the establishment, the goods, or the industrial or commercial activities, of a competitor;
(ii)   false allegations in the course of trade of such a nature as to discredit the establishment, the goods, or the industrial or commercial activities, of a competitor;

dispute settlement body of WIPO.[89] Further, it recognizes that natural and legal persons can invoke such provision to protect the divulsion of undisclosed information.[90] An information, to become eligible for protection under this agreement, has to fall under the following criteria:

"(a)   it is a secret in the sense that it is not, as a body or in the precise configuration and assembly of its components, generally known among or readily accessible to persons within the circles that normally deal with the kind of information in question;

(b)   it has commercial value because it is a secret; and

(c)   it has been subject to reasonable protective steps under the circumstances, by the person lawfully in control of the information, to keep it a secret". [91]

Here, one cannot find any explicit provision for accepting Shrink-Wrap agreements as pertaining to trade secret.[92] The crucial question is whether such an agreement should be considered as a reasonable step under the circumstance, to keep the information a secret. At this point, one can argue that the mass supply of a product coupled with a licensing agreement cannot be considered as a reasonable step to maintain secrecy. Thus, it is not entirely clear as to whether or under what circumstances, an information, confined in a widely distributed object code of a program, will or will not be held to have been disclosed.[93]

(iii)   indications or allegations the use of which in the course of trade is liable to mislead the public as to the nature, the manufacturing process, the characteristics, the suitability for their purpose, or the quantity, of the goods.

[89]   Supra note 39, p. 46.

[90]   Ibid., Article 39(2).

[91]   Ibid.

[92]   According to Article 39, the Obligation is only to provide protection to undisclosed information. However, from the criteria prescribed by the TRIPS, it has been subject to reasonable protective steps. But it is not clear what is the "reasonable protective steps". Therefore, contracting parties have the freedom to define what is a "reasonably protective step". Hence, a contracting party can place Shrink-Wrap agreements outside the scope of trade secret. Further, the information should not be known among, or readily accessible to persons within circles that normally deal with the kind of information in question. Therefore, a mass marketed product would not qualify for the protection under Article 39, of the TRIPS.

[93]   Supra note 80, p. 250.

Another question is related to the illegality of the licensing provision restraining reverse engineering. This provision can be challenged on the ground that it conflicts with the Art.39[94] of the TRIPS Agreement. However, this argument can be countered with Art.40[95] which prohibits anti-competitive provisions in the licensing agreements.

Thus, India can make provisions in the appropriate Act so that Shrink Wrap license does not come under the domain of trade secret. It can also make provisions to invalidate contractual restrictions on reverse engineering.

It is clear that the obligations that pertain to computer software protection, as envisaged in the above discussed multi lateral treaties are minimal. As far as copyright is concerned, the protection would not go beyond literal copying protection and there is no explicit provision to grant patent for software. Further, there is no obligation either to recognize the Shrink-Wrap Agreement as pertaining to trade secret or to accept the contractual restriction on reverse engineering. Thus, it leaves the respective countries with a free hand in determining the level of protection to be conferred by them to computer software. The reasons for this loose construction are :

1) the internal opposition in the US, Japan and EU against the over protection.[96]

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[94] Article 9(1) of EC directive on legal protection of computer programs reads: "The provision of this Directive shall be without prejudice to any other legal provisions such as those concerning patent right, trade-marks, unfair competition, trade secrets, protection of semi-conductor products or the law of contract. Any contractual provisions contrary to Article 6 or to the exceptions provided for in Article 5(2) and (3) shall be null and void".

[95] Article 40(1) and (2) of TRIPS reads: (1) "Members agree that some licensing practices or conditions pertaining to intellectual property rights which restrain competition may have adverse effects on trade and may impede the transfer and dissemination of technology.
(2) Nothing in this Agreement shall prevent Members from specifying in their legislation licensing practices or conditions that may in particular cases constitute an abuse of intellectual property rights having an adverse effect on competition in the relevant market. As provided above, a Member may adopt, consistently with the other provisions of this Agreement, appropriate measures to prevent or control such practices, which may include for example exclusive grantback conditions, conditions preventing challenges to validity and coercive package licensing, in the light of the relevant laws and regulations of that Members".

[96] In USA Organisations like Free Software Foundation, League for Programming Freedom, American Association for Interoperable Systems etc., is against the enhancement of IP protection for computer software. See Joel West, "Software Rights and Japan's Shift to an Information

2)   The persisting confusion among the developed countries regarding the appropriate legal framework for software protection.[97]

However, one should view this loose structure in the larger framework of the purpose of the treaty i.e., to enhance the international protection for intellectual property rights. This broad interpretation given to the provisions of the multi-lateral treaties pertaining to computer software, especially in the TRIPS, may in the future be altered by the decisions of the WTO dispute settlement body. But even the presence of such a likelihood does not prevent any of the contracting nations from framing their laws to meet the needs of the domestic software industry as long as it is within the parameters and space provided by these treaties.

Unfortunately, the Indian IP regime pertaining to software goes beyond the required international obligations on many issues (reverse engineering, fair-use, distribution right etc.). More alarming is the manner in which the Indian regime gives room for different interpretations on matters concerning software legalities and then creates a confusion which is ultimately left to be resolved by the courts (validity of Shrink-Wrap licence, software patent etc.). This disparity can only be cured by effecting appropriate amendments to the respective acts.

Society", *Asian Survey*, December 1995, pp.1118-39. Also see Jonathan Band and Masaobu Katoh, Interface on Trial- Intellectual Property in the Global Software Industry, West view press, Boulder, 1995, pp.226-316.

[97]   UNCTAD, Trade and Development Report 1991, p.187.

CHAPTER-V

Conclusion

CHAPTER V

CONCLUSION

Software industry is the leading information technology industry at the global level. Freed from the clutches of the hardware manufactures in the 70's, the software industry established an independent status. At present, the software is the prime component in a computer. Unlike the other manufacturing set-ups with their capital intensive work orientation, the software industry is not only labour intensive but also has low barriers to entry. This unique feature has been feasibly adopted by developing countries like India to make their presence felt in the global software industry. However, the developing countries' software firms are still in the process of catching up with the level of competence and technical finesse of the firms in the developed countries. Their presence in value added products like operating systems, mass marketing packages etc. are virtually nil.

The role of intellectual property rights in the development of the software industry is a debatable point with the IP regime taking a somewhat ambivalent stance. The rapid advancement in computer science as well as software development technology is due to the free exchange of information among the computer scientists and programmers. The present day techno giants in the software industry made their presence not because of their IP portfolio but the manner in which they conceived and marketed consumer friendly products. Moreover, none of these firms really invented any new component *per se*. Instead, they made use of the existing technology to design products suitable for the market. For instance, neither Microsoft nor Sun Microsystem 'invented' either Graphical user interface or Java respectively. Even today there are ample evidences of free exchange of pathbreaking advancements in software technology amongst the programmers (for eg. The Linux operating system). The very existence of this attitude of free exchange that leads to information dissemination

is a pointer to the fact that it is this attitude that acts as a stimulus to boost the programmers' creativity. In fact, the claim that an IPR regime that will cater to monopoly will lead to further creativity is an insubstantial one in the context of software (for eg. One can see the contribution of a whole lot of people from all over the world in further upgrading the Linux. A monopoly trend would not have made this possible). However, IPR has been used by the big firms in the industry to maintain their *de facto* monopoly. This effectively means that in this industry, with its network externality features, the newcomers will find it extremely difficult to maintain the *de facto* standards that have already been established. Hence, a strong protection to software through IP regime will only result in the inability of the developing countries to provide a competent industrial infrastructure for the domestic software firms.

The scenario in the developed countries, especially in the U.S. tends to such a strong protection even though there is the presence of an equally strong anti-protection lobby calling for the transparency and mass accessibility of technology. Though the software copyright protection in US is based on the idea-expression dichotomy, it not only covers the literal elements of a computer software but also the non-literal elements. Even the legally permissible space that allows the reverse engineering process is, like in the case of interface specification, based on case laws. But the absence of a statuary provision that legally endorses this view will narrow down the scope of both reverse engineering and interface specification. This statutory silence will be utilised by the software giants to argue against such fair use claim; this will in effect lead to a flood gate of litigations (This threat of litigation will ultimately emerge as the prime reason for a narrow scope). The response of the US government in fact corroborates the above mentioned observation in that the government's response to reverse engineering cases (*Sega* and *Atari*) was one in which a very narrow interpretation was given regarding the

scope of reverse engineering.[1] Thus, copyright protection has in a way gone beyond its professed ideal i.e. protection of the expression and not the idea, by extending patent-like protection to software as a whole. Patent protection too, after initial reluctance, was extended to computer software as an article of manufacture. This recognition of software as an article of manufacture is a product patent on software. This gives the patent holder an upper land to sue the competing developers of the alleged infringed copy. This is in fact a turn for the worse. Earlier, action could be taken only against the end user and perhaps the competing developer for contributory negligence. Moreover, the current position of Shrink-Wrap agreements and contractual restrictions on reverse engineering are totally based on case laws. So there is a possibility of change in future interpretations to facilitate a tighter regime. Shrink-Wrap agreements and reverse engineering ban may be strongly enforced. In addition to this, a further apprehension arises from the ongoing attempt to give a statutory recognition for Shrink-Wrap agreements by amending the Universal Commercial Code (UCC). Hence, we see that the overall scenario is one in which there is a cumulative protection for computer software. This would mean that the maneuvering space provided by one type of protection will be made ineffective by the provisions of another type of protection. Thus, the developments in the US IP regime pertaining to software will have significant ramifications for the software industries of developing countries.

The purpose of the IPR as expressed in the US Constitution is "to promote the progress of Science and useful Arts by securing for limited Times to Authors and Inventors the Exclusive Right to their respective Writings and Discoveries".[2] Thus, the original purpose of IPR was the sharing of ideas and discoveries for the

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[1] Letter of Ronald H. Brown, Secretary of Commerce, and Michael Kantor, United States Trade Representative, to the Honorable Hiroshi Kumagai, Minister of International Trade and Industry, dated November 2, 1993, Quoted by Band & Katoh, Interface on Trial: Intellectual Property and Interoperability in The Global Software Industry, West View, Boulder, pp. 299-303 (discussing United State's reaction to Japan's attempt to amend copyright law in order to make reverse engineering statutorily possible).

[2] US Constitution, Article 1, paragraph 8, Cl. 8.

benefit of society. However, this ideal has been relegated to the background and the granting of monopoly has become the primary function of IPRs. This happened due to the fall out on the perceptions of "progress" and "development". Both these terms were interpreted to mean a 'growth oriented upward trajectory'. It ignored the holistic view of development where the growth factor forms only a part. As a result, IPRs, originally a statutory right has been translated and interpreted as a 'natural right'[3] and also a 'personal right'.[4] Consequently, copyright which was initially used for the protection of publishers' monopoly became an instrument to 'stimulate' the author's creativity. Likewise, the patent which was, in its inception, a mechanism, to induce people to open their innovative ingenuity for the public became a provision to promote the R&D activities of the TNCs. In doing so, a strong IPR regime has been advocated for the economic development. In fact, it has been projected as the panacea for economic growth. Hence, the developing countries were advised to provide a strong IPR regime to promote transfer of technology and foreign direct investment even though there is no presence of any adequate proof to support the proposition.[5] This argument has no historical validity in that even the now 'developed' countries had in fact had a soft regime till a particular stage in the development of their software industry. The attempts of the developing countries to change this strong IP regime had an abrupt ending after the conclusion of the TRIPS agreement and WIPO's agreement with WTO to enhance co-operation so as to strengthen the IPR regime.

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[3] The Berne convention recognises Copyright as a natural right of the author.
[4] TRIPS Preamble recognises IPRs as personal right.
[5] Edwin Mansfield, "Intellectual Property Protection, Foreign Direct Investment and Transfer of Technology" Discussion paper 19, International Finance Corporation (IFC), Washington DC, 1994. Also see, for the conclusion of other studies, Anup Tikku, "Indian Inflow: The Interplay of Foreign Investment and Intellectual Property", *Third World Quarterly*, Vol. 19, 1998, pp. 87-113.

One should view these developments in the larger context of the right to development and also the critique of the existing development paradigm. The right to development includes the people's right to choose and control and also enjoy technology. Therefore, IP policies pertaining to software should be based on the following premises: (a) access to the information and also the technology (b) a proper dissemination of technology within the industry. If one looks at the obligations prescribed for the contracting parties in the IP regime it is found to be very stringent and opposed to the above said premises. But in the case of software there is no obligation either to extend patent protection to software or to recognise the Shrink-Wrap licenses. The international copyright regime, in its present scope, gives protection only against literal copying. However, the legal obligation to stop the circumvention of anti copying technological measures (WIPO Copyright Treaty) will in effect narrow down further the available maneuvering space in the international copyright regime. Therefore, any decision by India to ratify this treaty will have to be taken keeping in mind this situation (In the absence of any international compulsion to ratify the WIPO Treaty; the decision as to whether India should go forward with the proposed ratification need not be unduly hurried). Nevertheless, the IP regime pertaining to software does have a maneuvering space. This is mainly due to the persisting confusion in the developed countries with regard to the scope (horizontal and vertical) of protection of computer software. Developing countries like India can use this space to frame their software IP regime to serve the purpose of the domestic industry. This scenario may change in the future especially with regard to the obligation under the TRIPS agreement due to the interpretations of the WTO Dispute Settlement Body. But such a turn of event is a remote possibility given the competition between the US and the European Software giants(hence a consensus for enhancing protection is unlikely). Also, the vertical split within the software industry in the developed countries with regard to the enhancement of software IP

Protection will only compound the confusion as to the need for a protection consensus.

The present international IP regime pertaining to software has been criticised by certain sections of the academia.[6] According to them software protection is a legal hybrid which lies between copyright and patent. In other words, the idea-expression dichotomy is getting blurred in the case of software protection. Therefore, the present regime which maintains a bipolar nature will fail to extend an effective protection to software at the international level. This critique which encapsulates a sceptical view of the present IP regime pertaining to software gets a legitimacy when the threat of a future hardening of the regime is taken into account. This forces one. to be receptive to the argument which envisages a new paradigm for software IP protection. But, the low bargaining power of the developing countries makes them proceed cautiuously on this proposal too.

Indian software industry witnessed a tremendous growth in the last two decades. Advantages like cost effective labour has helped our experts, especially in the custom built sector, to establish a lead in the software markets of even the developed countries. However, the domestic industry is yet to be mature to meet the needs of the domestic market. Even now the mass-marketing packages are virtually under the control of foreign firms. Also, we are facing acute shortage in providing human resources and also value added products like operating systems and commonly used packages. (both at the international and domestic levels). We also see that there is a need to adapt the existing technology to the local languages in the light of the growing influence of software in the local administrative and developmental processes. Furthermore, we are unable to provide adequate software access to the masses. The zero tariff level that India will have to enforce on software imports from the year 2000 as per the Information Technology

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[6]   J.Reichman, "Legal Hybrids Between the Patent and Copyright Paradigms", *Colombia Law Review*, Vol. 94, 1994, pp. 2432-2558.   -

Agreement (of which India is a party) will result in a flooding of foreign software packages into the Indian market. When coupled with a strong IP regime, such a situation would mean a tightening of the competitive space which will leave the domestic software industry in a tougher situation. All this would require a well thought out competition strategy. For this a concerted effort from a well serviced domestic software network would be needed. This will have to be supplemented by a more dynamic software industry. This can be facilitated only through the proper access and dissemination of technology within the industry.

If one views the Indian software IP regime from the above perspective, we see that it fails to appreciate the realities and needs of the domestic industry. The existing copyright laws provides protection which are well beyond the international obligations. This, in effect, resulted in an overprotection of the proprietary rights of the software developer. Even after the new amendments the Indian Copyright Act has failed to provide the necessary conducive environment for the domestic software industry. Therefore, it calls for another comprehensive amendment of the copyright act. It should address the software IP issues from the point of view of mass accessibility and the dissemination of technology and information in the domestic industry.

Likewise, the patent act, also needs to be amended so as to ensure that patent protection for software per se is avoided. A legal mechanism is also needed to restrain the contractual obligations on reverse engineering and also to stop the recognition of Shrink-Wrap as a licence. (It should merely be recognised as a sale).

The other issues not addressed in this study but which definitely need to be examined are: (i) the interface between IPR and competition Laws. (2) the viability of a new paradigm shift in the IPR regime (3) the place of developing countries in such a regime and (4) the scope of public interest in a digital environment.

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