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COMPUTER PROGRAMS INTELLECTUAL PROPERTY PROTECTION IN CANADA AND INDIA

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COMPUTER PROGRAMS
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Chair of the Thesis Examination Board

ABSTRACT

The thesis considers the legal protection of computer programs in Canada and India. The research traces the development of protection of computer programs in Canada and India as these jurisdictions have taken divergent approaches to protect computer programs. It further studies the current legal approach adopted by the Canadian and Indian courts to combat the problem relating to protection of computer programs and it analyzes whether copyrights are an appropriate legal protection for computer programs from the point of view of computer program developers and consumers.

KEYWORDS

computer program, copyright, patent, business method, reverse engineering, literal elements of computer program, non-literal elements of computer program, computer software, computer, India, Canada.

DEDICATION

This thesis is dedicated to Ruchika – my sister, friend and guide.

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First and foremost, I would like to thank my thesis supervisor Prof. Mark Perry from the University of Western Ontario for his relentless support, invaluable insight, direction, constant guidance and time devoted to understand my research.

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Chapter One: The Beginning

1.1. Introduction

"Computers" have transformed our lives. Computers are all around; in homes, businesses and governmental agencies. In modern society, computers have become an important means to accomplish our day-to-day work. The human brain has been liberated from mundane tasks, and has been provided with ways to enhance some of its basic capabilities. We have already become dependent upon computers for the performance of tasks which, although once accomplished without mechanical aids, would now be unimaginably tedious in their absence. It is hard to imagine how the commercial world of international banking and finance, could ever again be conducted without computers. Yet we have still barely scratched the surface. The impact of computer industry far exceeds the original expectations. The computer industry has reached a turnover of $136.2 billion in 2008 and is forecasted to reach a turnover of $154.4 billion by 2013 in the G8 countries.[1] These figures explicitly show us the increase in the use of computers over the years.

With the increase in the use of computers, the capacity of computers has also increased.[2] The modern desktop or personal computers are more powerful than the largest machine

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[1] Datamonitor, *Computer Hardware-Global Group of Eight (G8) Industry Guide* (New York, Datamonitor, 2009). [*Datamonitor G8*]

[2]Colin Tapper, "Legal Problems Posed by Computers" in Gordon Hughes, *Essays on Computer Law* (Melbourne,Australia: Longman Professional, 1990) at 3. [*Tapper*]

of twenty five years ago.[3] Similarly computers have become easy to use, first by simplification of programming languages which are now easily accessible to children, and are indeed commonly taught in primary schools, and latterly by the development of cheap and readily available computer language packages.[4] Technology will improve, computing will become cheaper, feasible applications will multiply and the use of computers will become easier. Such predictions can be made with complete confidence, but while technology races ahead, driven by commercial pressure, it does not move with uniform success or complete predictability.

This thesis focuses on computer programs. It is the programmability of a computer that gives it its remarkable data processing abilities.[5] Without the ability to automate instructions to computers, they would be nothing more than simple calculators; instead computers are, with the help of programs, capable of achieving a wide variety of tasks from simply telling the time to controlling the space shuttle.[6] Furthermore, programs control the operation of the hardware and enable it to perform a wide variety of tasks from word processing and spreadsheets to databases and drafting systems to tele-prompters and air traffic control. The computer program is packed in a machine readable form and is a critical commodity in our information society.[7]

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[3] *Ibid.*

[4] *Ibid.*

[5] *Ibid.*

[6] Ralph D.Clifford, *Computers and Cyber Law* (Durham, North Carolina: Carolina Academic Press, 1999) at 10. [*Clifford*]

At the onset of computer development, the main focus was on the mainframes, thus computer programs were being installed on these mainframes, without additional costs.[8] Users hardly ever needed to copy the accompanying programs as there was no market for independently developed programs.[9] Thus protection was only being asked by developers for the hardware part and not for the computer program part.[10]

As computers gained significance in the lives of the public, the need for personal computers started to rise. With the rise in demand for personal computers, the demand for tailor made computer programs also increased. Computer developers such as IBM,[11] Remington Rand,[12] RCA,[13] Burroughs,[14] GE,[15] Honeywell,[16] NCR Corporation,[17] and

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[7]Richard O. Ward, *Copyright Law as Impacted by Changes in Computer Software Technologies*, (M.L.S., San Jose State University, 1992) [unpublished] at 5. [*Ward*]

[8] Robert O.Nimtz, "Development of the Law of Computer Software Protection" (January 1979) 61 Journal of the Patent Office Society 3 at 25. [*Nimtz*]

[9] *Ibid.*

[10] *Ibid.*

[11]IBM or International Business Machine is a multinational computer, technology and IT consulting corporation. Online: IBM <www.ibm.com >. (Last visited 04.07.2010).

[12] Remington Rand was an early American business machines manufacturer, best known originally as a typewriter manufacturer and in a later incarnation as the manufacturer of the UNIVAC line of mainframe computers. Online: Remington Rand < http://www.remington-rand.com>. (Last visited 04.07.2010).

[13]RCA Corporation, founded as Radio Corporation of America, is an electronics company. Online: RCA< http://home.rca.com/EN-US/Rcahome.html>. (Last visited 04.07.2010).

[14] The Burroughs Corporation was a major American manufacturer of business equipment. The company was founded in 1886 as the American Arithmometer Company and was assimilated in the 1986 merger that resulted in the creation of Unisys. Online: Unisys < http://www.unisys.com/unisys/>. (Last visited 04.07.2010).

[15] GE or General Electric is a multinational corporation dealing with appliances, aviation, consumer electronics, energy, finance, healthcare, lightening, entertainment, oil, gas, locomotive, water and software. Online: GE <http://www.ge.com/>. (Last visited 04.07.2010).

Control Data Corporation[18] started to unbundle computer programs from the hardware and started selling computer programs at additional cost.[19] As the demand for computer programs increased, a huge market started to grow which other computer program developers joined.

According to a recent study on the global software market, in 2008 the value of global software market reached to a turnover of $303.8 billion.[20] The study further predicted that by 2013, the global software market will reach a turnover of $457 billion, which is an increase of 50.5% since 2008.[21] Thus with this much money at stake, it isn't surprising that the software market has given rise to litigation.

Over the years intellectual property laws have been used in many jurisdictions and courts, as well as by markets, to protect both hardware and software aspect of the computer. Copyright laws and patent laws are the two types of intellectual property laws that have been used to protect computers and computer programs.

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[16]Honeywell is a major company that produces a variety of consumer products, engineering services, and aerospace systems for a wide variety of customers, from private consumers to major corporations and governments. Online: Honeywell < http://www51.honeywell.com/honeywell/>. (Last visited 04.07.2010)

[17] NCR Corporation is a technology company specializing in products for the retail, financial, travel, healthcare, food service, entertainment, gaming and public sector industries. Online: NCR Corporation < http://www.ncr.com/>. (Last visited 04.07.2010).

[18] Control Data Corporation was a corporation, incorporated to produce high speed, scientific computers. Online: Control Data Corporation <http://discover.lib.umn.edu/cgi/f/findaid/findaid-idx?c=umfa;cc=umfa;rgn=main;view=text;didno=cbi00080a>. (Last visited 04.07.2010)

[19] IBM, Remington Rand, RCA, Burroughs, GE, Honeywell, NCR Corporation, and Control Data Corporation were the nine major computer companies.

[20] Datamonitor, *Software: Global Industry Guide* (Toronto, Datamonitor, 2009). Abstract available online: <http://www.infoedge.com/product_type.asp?product=DO-4959>. (Last visited 04.07.2010) [*Datamonitor*]

[21] *Ibid.*

There is always uncertainty relating to the application of intellectual property laws to computer programs as the industry's rapid growth came before there were any laws specifically designed to handle computer programs and hardware disputes.[22] Thus when cases relating to computer programs came in front of the courts, judges had to perform a large amount of gap-filling and interpretation.[23] This lack of computer specific laws forced judges to apply laws that were developed for other purpose to computer program disputes in a make-shift fashion, leading to awkward, uneven application of the law.[24] Furthermore the complex nature of computer programs also led to awkward and absurd judgements by the courts as the technical nature of computer programs were not understood by the judges and the lawyers.[25] This led to 'randomness in the law'.[26]

1.2. Research Questions

The purpose of this thesis is to study the above stated 'randomness in the law'. In most jurisdictions, including Canada and India, computer programs are protected under both copyright and patent law. However it is difficult to adjudge, out of the two, which legal protection is most appropriate for computer programs. Both these legal protections were formulated before computer program technology originated, thus the ideas and assumptions behind both these legal protections lacked any rationale for protection of computer programs.

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[22] Graham D. Lawrence, *Legal battle that shaped the computer industry* (London: Quorum Books, 1999) at 3. [*Lawrence*]

[23] *Ibid.*

[24] *Ibid.*

[25] *Ibid.*

[26] *Ibid.*

This thesis addresses the above stated problem under the following three questions:

(1) Has the evolution of computer program protection led to divergent approaches in Canada and India?

(2) Is the current legal approach adopted by the Canadian and Indian courts appropriate to combat the problem relating to protection of computer programs?

(3) Is copyright the appropriate legal protection for computer programs from the point of view of computer program developers and consumers?

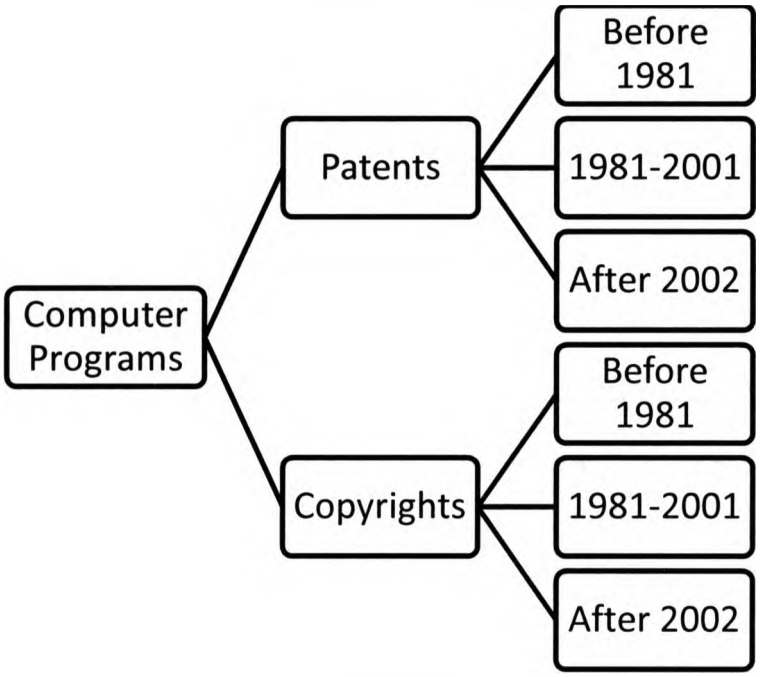

Figure 1: Methodology

To study the evolution of computer programs protection in Canada and India, the study has been divided into two parts: (a) Copyrights and (b) Patents. Further the study has been divided in three time frames: (a) Before 1981, (b) 1981-2001 and (c) After 2002.

These time frames have been made keeping in mind important changes in the jurisprudence of both the countries. The first time frame, before 1981, studies the early

legal protection given to computer programs. Before 1981, the computer program industry was at its initial stages and there was no proper legal protection. However with the advancement of the software market, a need to adequately protect computer programs arose. The second time frame, 1981 to 2001, traces how both countries accepted copyright and patents laws for computer programs. Further it traces the problems faced by the Canadian and Indian courts in applying copyright and patent laws to computer programs. The third time frame, after 2002, studies the consequences of applying copyright and patent laws to computer programs in Canada and India. At this stage the thesis will answer the first research question: how has the evolution of computer program protection led to divergent approaches in Canada and India?

Once it is clear that how computer program protection developed in Canada and India, the thesis will compare the current legal approach of Canada and India. At this stage the thesis will answer the second research question: is the current legal approach adopted by the Canadian and Indian courts appropriate to combat the problem relating to protection of computer programs?

After examining the evolution of computer program protection and the current legal approach, the research will address the advantages and disadvantages of protecting computer programs under copyright and patent from the point of view of computer program developers and consumers. At this stage the thesis will answer the third research question: is copyright the appropriate legal protection for computer programs from the point of view of computer program developers and consumers?

Thus the thesis aims to answer the above research questions and recommend any changes in the present legal approach of Canada and India for protecting computer programs.

1.3. Delimitation

1.3.1. Jurisdictions

This thesis considers the laws of Canada and India. India, a developing country, is in the initial stages of protecting its computer program industry. However Canada, a developed country, has legal jurisprudence, which has developed over the years to suit its computer program industry. Furthermore, Canada being the first among the two to protect computer programs, has applied various approaches to protect its computer program industry.

1.3.2. Laws

The thesis takes into consideration only patent and copyright laws. Most legal literature considers patent and copyright laws to be the appropriate legal protection for computer programs. Furthermore, the legislatures of Canada and India have made precise provisions in copyright laws to protect computer programs.

1.3.3. Historical Approach

The thesis takes a historical approach to answer the research question because history is an important source of knowing the future. Until and unless one knows the past, the future cannot be predicted. Also evaluating the mistakes made in the past and the direction of law in the past will help to predict new protection for the computer programs.

1.3.4. Legal Literature

The research undertaken in preparing this thesis only focuses on statutory history, government reports and judicial decisions of Canada and India, as the thesis looks only at the legal aspects of the problem.

1.3.5. The Role of United States of America

The thesis does not study the USA's stake in computer program protection in length but includes important information about the USA wherever required. USA is a forerunner and backbone of the computer program industry thus cannot be left out completely.

1.4. Words of Wisdom

The problem relating to protection of computer programs is not of recent origin. Many legal scholars worldwide have shown concern regarding the growing significance of this problem. To study the legal literature on computer program protection clearly, the study can be divided into two areas: first, legal scholars promoting copyright protection for computer programs and second, legal scholars promoting patent protection for computer programs.

Under the first category, legal scholars Dennis S. Karjala[27] and Karen Lynne Durell[28] in their articles promote the use of copyright laws to protect computer programs. Dennis S.

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[27]Dennis S. Karjala, "The Relative Roles of Patent and Copyright in the Protection of Computer Programs" (1998) 17 John Marshall Journal of Computer & Information Law 41. [*Karjala*]

[28] Karen Lynne Durell, "Intellectual Property Protection for Computer Software: How Much and What Form is Effective?" (2000) 8:3 International Journal of Law and Information Technology 231. [*Durell*]

Karjala proposes that computer programs should be protected under copyright laws as they are similar to literary works.[29] Further he states that copyright protects the program code, the computer program SSO[30] and computer program interfaces, thus all aspects of computer programs can be protected under copyright laws adequately.[31] To further uphold the above conclusion, Karen Lynee Durell states that the patent system overlooks the SSO element of computer programs which are the true nature of computer programs.[32]

Legal scholars Pamela Samuelson,[33] Randall M. Whitmeyer,[34] Yogesh Anand Pai[35] have taken a different approach which tries to prove that computer programs should not be protected under patents but under copyright laws. Pamela Samuelson states that the software industry has grown tremendously under the regime of copyright.[36] The fact that this growth has occurred without the aid of patent protection is powerful evidence that patent protection is not necessary for the software industry to thrive.[37] Further Randall M. Whitmeyer compares the advantages and disadvantages of protection of computer

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[29] *Karjala, supra* note 27 at 45.

[30] SSO is referred to as Structure, Sequence and Organization.

[31] *Karjala, supra* note 27 at 53.

[32] *Durell, supra* note 28 at 261.

[33] Pamela Samuelson, "Benson Revisited: The Case Agaisnt Patent Protection for Algorithms and Other Computer-Related Inventions" (1990) 39 Emory Law Journal 1025. [*Samuelson*]

[34] Randall M. Whitmeyer, "A plea for Due Process: Defining the Proper Scope of Patent Protection for Computer Software" (1990) Northwestern University Law Review 1103. [*Randall*]

[35] Yogesh Anand Pai, "Patent Protection for Computer Programs in India: Need for a Coherent Approach" (2007) 10:5 The Journal of World Intellectual Property 315. [*Pai*]

[36] *Samuelson, supra* note 33 at 1136.

[37] *Ibid.*

programs under patent law and copyright law.[38] He comes to a conclusion that advantages of copyright protection outweigh the advantages of patent protection, thus computer programs should be protected under copyright laws.[39] Adding to the above advantages of copyright protection for computer programs, Mark Perry[40] states that the advantage of protecting software under copyrights is that the protection is automatic and requires no formality.[41] Furthermore under copyright laws the author has the ability to formulate a variety of licensing agreements and assignments, which allows great flexibility to the creator of the work.[42]

Worldwide organizations such as League of Programming Freedom[43] and Free Software Foundation[44] also have the same views behind their claims that computer programs should not be patented as patenting hampers the growth of small companies. Further they propagate that patents grant monopoly to owner, thus resulting in slow advancement of software technology.[45]

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[38] *Randall, supra* note 34 at 1123.

[39] *Ibid.* at 1137.

[40] Mark Perry, "Chapter 30: Information Technology" in *Electronic Business Law* (Butterworths Lexis, 2004) at 30.4.2. [*Mark Perry*]

[41] *Ibid.*

[42] *Ibid.*

[43] The League of Programming Freedom is an organization consisting primary of programmers, whose purpose is to bring back the freedom to write software.

[44] The Free Software Foundation (FSF) is a nonprofit organization with a worldwide mission to promote computer user freedom and to defend the rights of all free software users.

[45] The League of Programming Freedom, "Against Software Patents" (1991-92) 14 Hastings Communication and Entertainment Law Journal 297 at 299. [*League of Programming Freedom*]

Under the second school of thought, legal scholars: Robert R. Deveza[46] and Willis E. Higgins[47] promote the use of patent laws to protect computer programs. Willis E. Higgins states that the use of software patents provide coverage for process and systems embodied in software and this reduces the need to broaden the scope of copyright protection.[48]

A recent study by Yogesh Suman and V K Gupta reveals that the software industry has grown tremendously due to the granting of software patents.[49] The paper concludes that a strong patenting regime in some countries has increased investors faith in the software industry, resulting in the increase of foreign direct investments.[50]

Further Katie Lula[51] states that the use of patents for computer programs helps in earning royalty from patented invention, which pays for the further research and development for newer, better inventions and technologies.[52] Similarly, Kamil Idirs[53] states that

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[46] Robert R. Deveza, "Legal Protection of Computer Software in Major Industrial Countries: A Survey of Copyright and Patent Protection for Computer Software" (1991) 9 UCLA Pacific Basin Law Journal 166. [*Deveza*]

[47] Willis E. Higgins, "The Case for Software Patent Protection" (1991-1992) 14 Hasting Communcation and Entertainment Law Journal 315 [*Higgins*]

[48] *Ibid.* at 319.

[49] Yogesh Suman and V K Ahuja, "Patenting Issues in Software Industry" (November 2002) 7 Journal of Intellectual Property Rights 516 at 522. [*Suman and Ahuja*]

[50] *Ibid.* at 523.

[51] Katie Lula, "How to See a Jar of Peanut Butter: Evaluating Empirical Studies of Patents and Patent Law" (2007) 7 Asper Review of International Business and Trade Law 152. [*Lula*]

[52] *Ibid.* at 158.

encouraging the introduction of patents to computer programs provides a public incentive and stimulates a nation's economic growth.[54]

Thus legal scholars under both the schools of thought have views regarding patent or copyright as the ideal protection for computer programs.

1.5. Defining Concepts

To comprehend fully the law that applies to computer technology, one must have some familiarity with the underlying technology. It would be hard, after all, to formulate an appropriate legal response to this new technology without having at least a rudimentary understanding of what a computer program is and how it is formulated. Thus in this part, it is intended to introduce the central concepts on which this thesis relies.

1.5.1 Computer Programs

The first concept upon which this thesis relies is the concept of the computer program. A computer program makes a modern computer operate. It can be written with a pencil and paper and is, directly or indirectly, a pure expression of the human intellect.[55] A program may take many forms: as letters and numerals handwritten or printed on paper; as holes in cards or a strip of paper; as different magnetised areas on a tape or disk; or as

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[53] Kamil Idris, "Intellectual Property: A Power Tool for Economic Growth" (2003) Wipo Publications Online: <http:// www.wipo.int/export/sites/www/freepublications/en/intproperty/888/wipo_pub_888_1.pdf>. (Last visited 25.06.2010.) [*Idris*]

[54] *Ibid.* at 10.

[55] Hugh Brett & Lawrence Perry, *The legal protection of computer software* (Oxford, United Kingdom: ESC publishing limited, 1981) at 1. [*Brett and Perry*]

permanent or temporary connection in electric circuits.[56] Occasionally the same program may be translated in different ways to operate in different machines.[57] Thus it is the programmability of a computer that gives it its remarkable data processing abilities.[58] Without the ability to automate the instructions to computers, they would be nothing more than simple calculators; instead computers are, with the help of programs, capable of achieving a wide variety of tasks from simply telling the time to controlling the space shuttle.[59]

Programs are developed by programmers using specially defined computer languages. A computer language is a defined set of symbols governed by defined rules.[60] There are two broad classes of computer languages, those directly associate with the machine's operation, typically termed 'machine code'[61] or object code or machine language, and those designed for better human comprehension of the machine's operation called 'source code'[62] or 'higher level languages'[63].[64] The essence of a computer language is to enable

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[56] *Ibid.*

[57] *Ibid.*

[58] *Clifford, supra* note 6 at 10.

[59] *Ibid.*

[60] J. W. K. Brunside, "The Fundamental of Computer Technology" in Gordon Hughes, *Essays on Computer Law* (Melbourne,Australia: Longman Professional, 1990) at 25. [*Brunside*]

[61] The instructions required to define the processing required to be performed expressed in a format that the computer can directly interpret. This format of code is not readily understandable by human but can be interpreted very efficiently by the computer. *Delrina Corp. v. Triolet System, Inc.* (1992), 47 C.P.R. (3d) 1 (Ont.H.C.) in Sookman, *Computer, Internet and Electronic Commerce Terms: Judicial, Legislatuve and Technical Definations* (Toronto,Canada: Thomsan Carsewell,2004) at 251. [*Sookman Defination*]

[62] Source code is a set of computer instructions that are written in a structured programming language that is human readable. It is the opposite of object code.
Instructions required to define the processing steps required and expressed in a format that the human programmers can more easily work with. This format of code is not readily understandable by the computer

the programmer to operate at a high level of abstraction, instead of operating at the very fundamental level at which the computer will ultimately execute the program.[65] But, no matter what language a program is written in, the computer can only run on machine codes.[66]

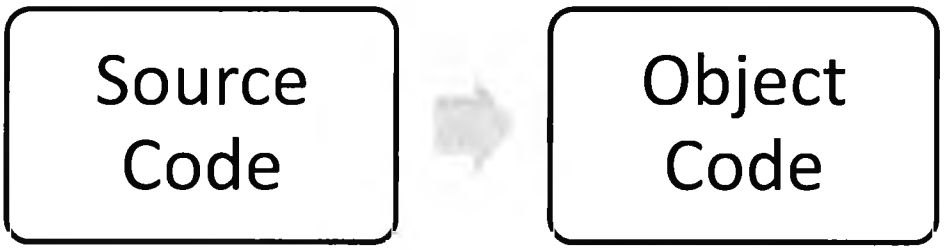

Figure 2: Simplified Model for Computer Program Development

The simplified model for the development of computer programs consists of two phases which can be summarized as follows. The first phase is the development of a source code which is written by the computer program developer in a computer programming language[67].[68] Source codes can also be punched on decks of cards or imprinted on discs, tapes or drums. The second phase is the development of an object code which is a conversion of the programming language into machine language. The object codes are

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but can be interpreted more easily by the programmer. The notion use to express the instructions is referred to as a computer language. *Delrina Corp. v. Triolet System, Inc.* (1992), 47 C.P.R. (3d) 1 (Ont.H.C.) in *Sookman Defination, supra* note 61 at 324.

[63] Examples of High level languages are COBOL, PASCAL, BASIC, C, FORTRAN.

[64] *Clifford, supra* note 6 at 11.

[65] *Brunside, supra* note 60 at 29.

[66] *Ibid.* at 30.

[67] Examples of programming language are COBOL, BASIC, C, C++, JAVA, C#, Windows PowerShell, Go etc.

[68] *Clifford, supra* note 6 at 23.

generally in the form of '0'and '1'. When these object codes enter into the mechanical process, they cannot be read without the aid of special equipment and cannot be understood by even the most highly trained programmers.[69] However, due to wide use and rapid development of computer programming techniques, the above stated phases for the development of computer programs are more complex. Some computer programs which are formulated by using languages such as JAVA have more than simply source and object codes. When a computer program developer uses these new languages, the source code does not directly get converted into object code.[70] For example, when a computer program developer writes codes in the JAVA language, these codes get translated by the compiler into a form called "bytecode" i.e. the source code does not get directly translated into object code.[71] This code can be executed in two ways: by feeding it directly to an interpreter or by having the consumer translates it into object code.[72] Thus when computer program developers uses these new languages for making computer programs, the computer program codes does not only contain object codes and source codes but also contain other types of codes.

There are a number of recognised legal rights which may prevent the unauthorised use and copying of computer programs. They may be categorised under the following

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[69] *Ibid.*

[70] David S. Touretzky, "Source vs. Object Code: A False Dichotomy" (2000) Online: <http://www.cs.cmu.edu/~dst/DeCSS/object-code.txt>. (Last visited 25.08.2010). The Touretzky essay was admitted in evidence at trial in *Universal City Studio et al vs. Eric Corley* (2001), 273 F.3d 429.

[71] Jerome Miecznikowski and Laurie Hendren "Decompling Java Bytecode: Problems, Traps and Pitfalls" in R. Nigel Horspool, *Compiler Construction* (Berlin: Springer, 2002) at 111.

[72] *Ibid.*

headings-patents, copyrights, trade-secret, criminal law-each of which, by different routes, provides a possible means to protect computer programs. Of these, only the *Canadian Copyright Act* and the *Indian Copyright Act* give precise definitions of a computer program.

The *Canadian Copyright Act, 1985* section 2 states that the term computer program means:

> A set of instructions or statements, expressed, fixed, embodied or stored in any manner that is to be used directly or indirectly in a computer in order to bring out a specific result.[73]

On the other hand the *Indian Copyright Act, 1957* section 2(ffc) defines the term computer programme[74] as

> A set of instruction expressed in words, codes, schemes or in any other form, including a machine readable medium, capable of causing a computer to perform a particular task or achieve a particular result.[75]

1.5.2. Copyright

The second concept that this thesis relies upon is copyright. Copyright implies the rights of individual creators like artists, poets, authors, musicians, etc. in their creations.[76] For example, this thesis is a copyrightable document. As soon as I have written down text or

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[73] Canadian *Copyright Act*, 1985, R.S.C. 1985, c. C-42.

[74] In India the term 'computer program' is written as 'computer programme'.

[75] Indian *Copyright Act*, 1957, 14 of 1957.

[76] Asian School of Cyber Laws, *IPR & Cyberspace-The Indian Perspective* (Pune, India: Asian School of Cyber Laws, 2009). Online: <www.asianlaws.org> (Last visited: 04.07.2010) [*Asian School of Cyber Laws*]

compiled the text, the document is my expression so it becomes a copyrightable document. As sole author of this work, I have the exclusive right to copy, distribute or further adapt my work for a certain period of time after which it enters into the public domain.[77] Thus copyright law is that branch of intellectual property laws that addresses the rights of an individual creator.[78]

Someone who makes uses or sells a copyrighted work without permission of the author is said to infringe the copyright. The author upon discovering an infringement may sue and obtain monetary damages or an injunction.

India and Canada hav e different meaning of copyright and duration after which the work/creation goes into the public domain. In Canada copyrights are controlled by *Copyright Act, 1985.*[79] Section 3 of the *Copyright Act, 1985* defines copyrights:

> In relation to a work as to produce or reproduce the work or any substantial part thereof in any material form whatever, to perform the work or any substantial part thereof in public or, if the work is unpublished, to publish the work or any substantial part thereof, and includes the sole right:
> (a) To produce, reproduce, perform or publish any translation of the work,
> (b) In the case of a dramatic work, to convert it into a novel or other non-dramatic work,
> (c) In the case of a novel or other non-dramatic work, or of an artistic work, to convert it into a dramatic work, by way of performance in public or otherwise,
> (d) In the case of a literary, dramatic or musical work, to make any sound recording, cinematograph film or other contrivance by means of which the work may be mechanically reproduced or performed,
> (e) In the case of any literary, dramatic, musical or artistic work, to reproduce, adapt and publicly present the work as a cinematographic work,

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[77] Protection term under copyright laws of Canada is life of the author plus 50 years whereas protection term under copyright laws of India is life of the author plus 60 years.

[78] *Asian School of Cyber Laws*, *supra* note 76.

[79] Canadian *Copyright Act*, 1985, R.S.C. 1985, c. C-42.

> (f) In the case of any literary, dramatic, musical or artistic work, to communicate the work to the public by telecommunication,
> (g) To present at a public exhibition, for a purpose other than sale or hire, an artistic work created after June 7, 1988, other than a map, chart or plan,
> (h) In the case of a computer program that can be reproduced in the ordinary course of its use, other than by a reproduction during its execution in conjunction with a machine, device or computer, to rent out the computer program, and
> (i) In the case of a musical work, to rent out a sound recording in which the work is embodied, and to authorize any such acts.[80]

Furthermore, section 6 to 12 of the Act states the term of copyright in different works such as anonymous[81] pse udonymous,[82] posthumous, [83] j oint-authorship,[84] phot ograph,[85] cinematographic[86] and work belonging to her majesty[87] for a period of **fifty years** following the end of the calendar year in which the author dies or the work (anonymous, pseudonymous, posthumous, joint-authorship, photograph, cinematographic and work belonging to her majesty) is published.

In India copyrights are controlled by the *Copyright Act, 1957.*[88] Section 13 of the *Copyright Act, 1957* grants exclusive rights to the owner of the original; literary, dramatic, musical and artistic works; cinematograph films; and sound recording.[89]

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[80] *Ibid.*

[81] Section 6.1 of the Canadian *Copyright Act*, 1985, R.S.C. 1985, c. C-42.

[82] *Ibid.*

[83] *Ibid.* at s.7.

[84] *Ibid.* at s.9.

[85] *Ibid.* at s.10.

[86] *Ibid.* at s.11.1.

[87] *Ibid.* at s.12.

[88] Indian *Copyright Act*, 1957, 14 of 1957.

Furthermore according to Section 14 of the *Copyright Act, 1957*:

> Copyright means the exclusive right to do or authorise the doing of any of the following acts in respect of a work or any substantial part thereof,
> (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 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;
> (v) To make any translation of the work;
> (vi) To make any adaptation of the work;
> (vii) To do, in relation to a translation or an adaptation of the work, any of the acts specified in relation to the work in sub clauses (i) to (vi);
> (b) In the case of a computer programme,-
> (i) To do any of the acts specified in clause (a);
> (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 commercial rental does not apply in respect of computer programmes where the programme itself is not the essential object of the rental.
> (c) In the case of an artistic work,-
> (i) To reproduce the work in any material form including depiction in three dimensions of a two dimensional work or in two dimensions of a three dimensional work;
> (ii) To issue copies of the work to the public not being copies already in circulation;
> (iii) To include the work in any cinematograph film;
> (iv) To make any adaptation of the work;
> (v) To do in relation to an adaptation of the work any of the acts specified in relation to the work in sub clauses (i) to (iv);
> (d) In the case of a cinematograph film,-
> (i) To make a copy of the film, including a photograph of any image forming part thereof;
> (ii) To sell or give on hire, or offer for sale or hire, any copy of the film, regardless of whether such copy has been sold or given on hire on earlier occasions;
> (iii) To communicate the film to the public;
> (e) In the case of a sound recording,-
> (i) To make any other sound recording embodying it;

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[89] *Ibid.*

(ii) To sell or give on hire, or offer for sale or hire, any copy of the sound recording regardless of whether such copy has been sold or given on hire on earlier occasions;
(iii) To communicate the sound recording to the public.[90]

Computer programmes under the *Indian Copyright Act, 1957* are included within the definition of a literary work. Computer databases, tables and compilation are also entitled to protection as literary work.

Furthermore, section 22 to 29 of the *Indian Copyright Act, 1957* states the term of copyright in different works such as literary,[91] dramatic,[92] musical,[93] artistic,[94] anonymous,[95] pseudonymous,[96] posthumous,[97] photographs,[98] cinematograph films,[99] sound recording,[100] government works,[101] works of public undertaking[102] and works of

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[90] *Ibid.*

[91] *Ibid.* at s. 22.

[92] *Ibid.*

[93] *Ibid.*

[94] *Ibid.*

[95] *Ibid.* at s.23.

[96] *Ibid.*

[97] *Ibid.* at s.24.

[98] *Ibid.*

[99] *Ibid.* at s.26.

[100] *Ibid.* at s.27.

[101] *Ibid.* at s.28.

[102] *Ibid.* at s. 28A.

international organizations[103] until **sixty years** from the beginning of the calendar year next following the year in which the author dies or the work (posthumous, photographs, cinematograph films, sound recording, government works, works of public undertaking and works of international organizations) is published.

Apart from the above stated rights given to the author of the copyrightable work the copyright acts of both the countries forwards another set of rights knows as 'moral rights'. Under these rights the author of the copyrightable work has the right to protect the attribution and integrity of his or her work. Section 14.1 of the *Canadian Copyright Act* states that 'the author of the copyrightable work has the right to integrity of his work'.[104] On the other hand, Section 57 of the *Indian Copyright Act* states that 'the author of the work has the right to claim authorship of the work and restrain or claim damages of any distortion, mutilation, modification or other acts in relation to the copyrightable work, which would be prejudicial to the honour or reputation of the author of the copyrightable work'.[105] These rights in both the countries subsist for the same term as the copyright in the work.[106] However these rights cannot be assigned by the author of the copyrightable work but can be waived off in whole or in part by him or her.[107]

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[103] *Ibid.* at s.29.

[104] Section 14.1 of the Canadian *Copyright Act,* R.S.C. 1985, c. C-42.

[105] Section 57 of the Indian *Copyright Act,* 1957,14 of 1957.

[106] Section 14.2 of the Canadian *Copyright Act* and section 57 of the Indian *Copyright Act.*

[107] Section 14.1 of the Canadian *Copyright Act* and section 57 of the Indian *Copyright Act.*

1.5.3 Patent

The third concept that this thesis relies upon is patents. Patent laws grant the holder of a patent the exclusive right to make, use or sell the invention covered by the patent for a period of twenty years from the date the application for the patent was filed.[108] It is granted by the Patent Office to an invention only if it in new, non-obvious and possesses utility (and, in case a patent is applied in India, the inventions should also possess industrial application).[109] The first requirement dictates that nothing like the invention must have come before i.e. the subject matter must not have been described in a patent or other publication more than one year before the filing date. The second requirement demands that there be some inventive ingenuity evident i.e. the invention must not appear to be obvious to a workman skilled in the particular art. The third requirement stipulates that someone skilled in the art must be able to construct the patented invention and use it for some beneficial purposes. Finally, the last requirement; industrial application is only a requirement for granting an invention a patent in India. It means that the invention should be useful and applicable to the Indian industrial sector.

Patents are more effective than copyrights when it comes to protecting the idea or functionality of an invention.[110] For example, an invention relating to a particular device,

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[108] George S. Takach, *Essential of Canadian Law* (Toronto: Irwin Law Inc., 2003) at 93. [Takach]

[109] Under the Canadian *Patent Act*, there are only three prerequisites i.e. the product should be new, non-obvious and possess utility. However the Indian *Patent Act* has another pre-requisite apart from the above stated pre-requisite, which is industrial application.

[110] *Suman and Ahuja, supra* note 49 at 518.

used for making voice calls.[111] The patent owner has the right to prohibit anyone from making, using or selling the same device. In general, the patent owner grants or withholds this right just as he grants or withholds the right to enter his house. Thus the exclusive right granted by the patent, enables the patent owner to attempt to profit from the patent in a variety of ways.[112] The patent owner may, for example, choose to manufacture the device himself and exclude competitors from doing so, thereby extracting a premium price, or he may, allow others to manufacture the device in exchange for a payment referred to as a royalty.

In Canada, patents are controlled by the *Patent Act, 1985.*[113] Section 2 of the Act specifies that an invention means:

> Any new and useful art, process, machine, manufacture or composition of matter, or any new and useful improvement in any art, process, machine, manufacture or composition of matter. No patent can be issued for a mere scientific principle or abstract theorem.[114]

On the other hand in India, patents are controlled by the *Patent Act, 1970.*[115] Section 2(j) of the Act specifies that an invention means

> A new product or process involving an inventive step and capable of industrial application.[116]

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[111] For Example, MagicJack. It is a device that plugs into a USB port on a user's computer and uses a standard phone jack to connect to a telephone receiver. The device uses voice over internet protocol (VOIP) transmission technology to make and receive voice calls. This device has been patented by Daniel M. Borislow. Online <www.magicjack.com>. (Last visited: 24.07.2010).

[112] *Takach, supra* note 108.

[113] Canadian *Patent Act*, 1985, R.S.C.1985,c.P-4.

[114] *Ibid.*

[115] Indian *Patent Act*, 1970, 39 of 1970.

[116] *Ibid.*

The patent system grants the owner of the patent the exclusive right to use or sell a patented invention for a certain period of time. Section 42 of the *Canadian Patent Act*, grants the patentee the exclusive right to manufacture, use and sell an invention for the term of patent which is **twenty years** from the date on which the application for the patent is filed.[117] Similarly Section 53 of the *Indian Patent Act, 1970* grants the exclusive right to the patent holder to manufacture, use and sell an invention for a period of **twenty years** from the date on which the patent is filed.[118]

To sum up, patents grant monopoly right to the inventor to exploit his invention. During this period, the inventor is entitled to exclude anyone else from commercially exploiting his invention.[119] An invention is patentable only when it is new, non-obvious and possesses utility (and, in case a patent is applied in India, the inventions should also possess industrial application).[120] After the expiry of the term of patent, it falls into public domain and become public property.[121] Any member of the public can thereafter use the invention without previous authorisation of the inventor and without paying any royalty to him.[122] The grant of a patent not only recognises and rewards the creativity of the

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[117] Canadian *Patent Act*, 1985, R.S.C.1985,c.P-4.

[118] Indian *Patent Act*, 1970, 39 of 1970.

[119] V.K. Ahuja, *Law Relating to Intellectual Property Rights* (New Delhi, India: Lexis Nexis Butterworths, 2007) at 391.[V.K.Ahuja]

[120] *Supra* note 109.

[121] *V.K.Ahuja, supra* note 112 at 140.

[122] *Ibid.* at 5.

inventor, but also acts as an inspiration or catalyst for further inventions which ultimately contributes to the technological development of a nation.[123]

1.6. Summary of Chapters

The thesis has been divided into four parts. Chapter 2, titled 'Journey from Mainframe to Personal Computers', traces in concise the evolution of computers from mainframe computers to tailor made/personal computers. It also depicts the development of computer programs, which made them a valuable property and gradually raised the need to legally protect them. Chapter 3, titled 'Development of Computer Program Protection in Canada and India,' traces the development of protection for computer programs in Canada and India. It explains how computer programs were brought under the ambit of intellectual property rights and explains the problem faced by the legislature and the courts in applying intellectual property laws to computer programs. Chapter 4, titled 'Patent vs. Copyright-The Actual Showdown', explains the advantages and disadvantages of using patents or copyrights as a protection for computer programs from the point of view of computer program developers and consumers. Lastly, Chapter 5 titled 'Conclusion' concludes the appropriate protection for computer programs and also summarizes and recommends the future approach for different elements of computer programs.

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[123] *Ibid.*

Chapter Two: Journey from Mainframe to Personal Computers

2.1. Computers

2.1.1. The Birth of a New Age

Who invented the computer is not a question with a simple answer. The real answer is that many inventors contributed to the history of computers and that a computer is a complex piece of machinery made up of many parts, each of which can be considered as a separate invention.

The limitations of the human body's ten fingers and ten toes caused the early man to construct a tool to help with their calculations. This led to the formulation of Abacus, an apparatus which used a series of moveable beads or rocks. It helped in performing mathematical operations.

However, it was Leonardo Da Vinci's mechanical calculator in 1500 that started the development in the field of computing.[124] Soon thereafter, in 1642, Blaise Pascal's adding machine upstaged Da Vinci's marvel and moved computing technology forward.[125]

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[124] Marguerite Zientara, *The History of Computing,A Biographical Protrait of the Visonaries Who Shaped the Destiny of the Computer Industry* (Framingham, Massachusetts, USA: Computer World, CW Communications, 1981) at 2. [*Zientara*]

[125] *Ibid.*

The history of computer technology can be divided into two stages; first stage is the mechanical age, in which the main focus of the scientists was on the mainframe computers. The second stage is the digital age, in which the focus of the scientists was on personal computers.

2.1.2. Mechanical Age

The mechanical age of computation probably began with the mechanical computer of Charles Babbage.[126] He proposed the construction of a machine that could calculate numbers and also print mathematical tables.[127] He named the machine the Babbage Difference Engine.[128] However, even though he was unable to construct the actual device, he is still known as the father of computing.[129] Not satisfied with the limitations of the Babbage Difference Engine, he drafted plans for the Babbage Analytical Engine.[130] He intended to use punch cards as control mechanism for calculations.[131] This feature made it possible for his new machine to use previously performed calculations in new ones.[132] Babbage's idea caught the attention of Ada Byron Lovelace[133] who had an undying

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[126] *Ibid.* at 9.

[127] *Ibid.*

[128] *Ibid.*

[129] *Ibid.*

[130] *Ibid.* at 11.

[131] *Ibid.*

[132] *Ibid.*

[133] Daughter of poet Lord Byron. She was an enthusiastic supporter of Babbage's work.

passion for math.[134] She helped Babbage move his project from an idea to a reality by documenting how the device would calculate Bernoulli numbers.[135] She later received recognition for writing the world's first computer program.[136]

Parallel to Babbage computing machines, Herman Hollerith in 1890 designed a machine known as the Hollerith Desk to mechanically take the entire census of the American population.[137] After being successful in making the machine, Hollerith formulated a company known as the Tabulating Machine Company which over the years and after a few buyouts became the International Business Machines (IBM).[138]

Seeing the huge success of the Hollerith Desk, the U.S. military was looking to invest in schemes which would automate the computation of firing tables as there was shortage of manpower to keep up with the need for the new tabulations.[139] This led to investment by the U.S. military in the Harvard Mark I computer which was built in a partnership between Harvard and IBM in 1944.[140] It was the first programmable digital computer

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[134] *Zientara, supra* note 124 at 12.

[135] *Ibid.*

[136] To recognize the work done by Ada Byron Lovelace in the field of computing, the United States Department of defence named a computer language "ADA' in her honour in 1979. Online: < http://www.britannica.com/EBchecked/topic/130670/computer-programming-language/248123/Ada#ref=ref849835>. (Last visited 5.07.2010)

[137] *Zientara, supra* note 124 at 22.

[138] Madeleine de Cock Buning, "The history of copyright protection of computer software" in Karl de Leeuw and Jan Bergstra, *The History of Information Security: A Comprehensive Handbook* (MO,USA: Elsevier B.V., 2007) at 122. [*Buning*]

[139] *Ibid.*

[140] *Ibid.*

made in the U.S. but it was not a purely electronic form of computer.[141] It was built on switches, relays, rotation shafts and clutches.[142] The primary programmer for the MARK I was Grace Hooper.[143] In 1953 Grace Hooper also invented the first computer high-level language, Flow-matic.[144] This language eventually became COBOL.[145] She also constructed the world's first compiler which is required by the computer to translate a high level language to a binary language.[146]

At the same time when Harvard and IBM were making the MARK I computer, other scientists were also developing electronic computers. In 1937 J. V. Atanasoof, a professor of physics and mathematics at Iowa State University attempted to make an all electronic digital computer which had no gear, cams, belts and shafts.[147] He and his student Clifford Berry succeeded in 1941 by making a machine known as Atanasoff-Berry Computer (ABC) that could store data as a charge on a capacitor. However, this machine could not be reprogrammed; hence, it was not pursued after World War II.[148]

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[141] *Ibid.*

[142] *Ibid.*

[143] Grace Hooper coined the computer lingo "debugging" when she found a dead moth that had stuck into the Mark I computer and the moth wings were blocking the reading holes in the paper tape. Thus the term "debugging" refers to describe the process of eliminating program faults.

[144] *Zientara, supra* note 124 at 53.

[145] Donald H.Sanders, *Computers Today* (New York: McGraw Hill Book Company, 1983) at 372. [*Sanders*]

[146] *Zientara, supra* note 124 at 53.

[147] *Ibid.* at 49.

[148] *Ibid.*

Similarly, Britain also joined the race for computing by designing and building an electronic machine known as Colossus.[149] This machine was dedicated to break the coded codes of German radio transmission in World War II.[150] However, Colossus was also not a reprogrammable machine.[151]

In 1965 the work of Konrad Zuse was revealed, which shocked the computer scientists.[152] Zuse had built a sequence of general purpose computers in Nazi Germany.[153] The Z1[154] and Z2[155] were built in 1936 and 1938 respectively.[156] The Z3[157] was built in 1941 on Babbage's concept of programming and was probably the first operational, general purpose and programmable digital computer.[158] Zuse's accomplishments are all the more incredible given the context of the material and manpower shortages in Germany during World War II. The architecture of these machines is still in use today; an arithmetic unit to do the calculations, a memory for storing numbers, a control system to supervise

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[149] B. Randell, "The Colossus" in N. Metropolis , J. Howlett, Gian Carlo Rota, *A History of Computing in the Twentieth Century* (New York: Academic Press Inc., 1980) at 47.

[150] *Ibid.* at 48.

[151] *Ibid.* at 48.

[152] Raul Rojas, "The Zuse Computers" in Computer Conservation Society, *Computer Resurrection* (Manchester, UK: The Britsh Computer Society, 2006) at 8.
Online: < http://www.cs.manchester.ac.uk/other/CCS/res/pdfs/res37.pdf>. (Last visited 5.07.2010)

[153] *Ibid.*

[154] *Ibid.*

[155] *Ibid.*

[156] *Ibid.*

[157] *Ibid.*

[158] *Ibid.*

operations, and input and output devices to connect to the external world.[159] Zuse also invented the first high-level computer language, Plankalkul, though it was unknown outside Germany.[160]

2.1.3. Digital Age

Coming to the digital age, usually ENIAC[161] is said to be the forerunner in digital computers.[162] It was built at the University of Pennsylvania and put into service in 1946 by Prof. John Mauchly and J. Presper Eckert on the funding given by the war department of USA.[163] They proposed to build a machine that could replace all computers and humans for calculating the firing tables of the army's artillery.[164] However, ENIAC was built with vacuum tubes and reprogramming of the computer required a physical modification of all the patch cords and switches.[165] This limitation resulted in days to change the machine to suit different programs.[166] Thus, to eliminate this limitation, Prof. John Mauchly and J. Presper Eckert teamed up with John von Neumann, a mathematician, to design EDVAC[167] which was an upgraded version of the ENIAC.[168]

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[159] *Ibid.*

[160] Plankalkul was the first high level programming language.

[161] ENIAC, Electronic Numerical Integrator and Calculator.

[162] *Sanders, supra* note 145 at 38.

[163] *Ibid.*

[164] *Ibid.*

[165] Scott Mc Cartney, *ENIAC, The Triumph and Tragedies of the World's First Computer* (New York: Walker and Company, 1999). [*Cartney*]

[166] *Ibid.*

[167] EDVAC, Electronic Discrete Variable Automatic Computer.

Success of the EDVAC and ENIAC led to the formulation of the UNIVAC[169] in 1951. UNIVAC was the first commercially available computer.[170] Similarly IBM also started commercializing its computer by developing the IBM-650.[171] It was a comparatively less expensive machine for that time and it was widely accepted. This machine gave IBM the leadership in computer production in 1955.[172]

During the 1960s, many organizations started acquiring these machines for data processing purposes, even though these machines had been designed for scientific use only.[173] Organizations generally considered these machines to be helpful accounting tools and thus the first applications that were designed for these machines were to process routine tasks such as payrolls. [174]

Soon the demand for these machines grew and computer developers started introducing machines which were smaller, faster and had greater computing capacity.[175] The vacuum tubes, due to their relative short life, gave way to compact solid state components such as

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[168] *Sanders, supra* note 145 at 38.

[169] UNIVAC, Universal Automatic Computer.

[170] *Sanders, supra* note 145 at 38.

[171] *Ibid.*

[172] *Ibid.*

[173] *Ibid.*

[174] *Ibid.*

[175] *Ibid.*

diode and transistor.[176] Also the practice of writing application programs in machine oriented languages gave way to higher level languages that were easier to understand.[177]

This led to commercialization of computers as the new machines were no longer one of a kind hand built devices used only by universities and government research labs.[178] As the demand of computers increased, the demand for new computing abilities also increased. This demand led to the growth of the computer program industry as an independent industry.

2.2 Computer Program

Before 1950, the main focus of the computer market was on the mainframe computers.[179] The earliest digital computers required highly sophisticated users since libraries of programs were not available.[180] Computers were only being used by universities and government research labs thus the concept of protecting computer programs as separate and distinct property did not enter the minds of the scientist.[181] Computer developers were using computers only to solve computational problems.[182] Also each installation of the computer was so unique that programs could not be interchanged except with great

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[176] *Ibid.*

[177] *Ibid.*

[178] *Nimtz, supra* note 8 at 7.

[179] *Ibid.*

[180] *Ibid.*

[181] *Ibid.*

[182] *Ibid.*

difficulty.[183] Thus, for the reason pertaining to the design of early computers, computer programs were not separable from hardware. Even though few institutions were using computer programs, the passing of computer programs from one computer to another did not arise. Thus there was neither the need nor the desire to protect computer programs.

However, after coming up of UNIVAC and IBM-650, commercialization of computers started to rise.[184] This growing demand for computers by the public also demanded for variety of programs that could be used on the computers.

IBM being the leading computer manufacturer in 1950s adopted a market approach that included the concepts of bundling and program sharing.[185] Under bundling, IBM sold its mainframe computer and offered some programs with it.[186] IBM's market success led to other mainframe manufactures such as Remington Rand, Raytheon, RCA, Burroughs, GE, Honeywell to imitate the same bundling approach.[187]

To further increase computer program availability and usage of computers, manufacturers encouraged customers to join together in computer program sharing organizations.[188]

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[183] *Ibid.*

[184] *Sanders, supra* note 145 at 38.

[185] *Nimtz, supra* note 8 at 7.

[186] *Ibid.*

[187] *Ibid.*

[188] SHARE Inc. is an independent, volunteer run association providing enterprise technology professionals with continuous education and training, valuable professional networking and effective industry influence. Online <www.share.org>. (Last visited 5.07.2010).

Organization's such as 'SHARE' group of users were formulated which encouraged the customers to make contributions to a software pool from which other members could withdraw and utilize the contributed programs at no extra cost.[189] This sharing concept reinforced the belief that software should not be vested with property rights.[190]

As time passed some users made significant changes to programs and started using their programs in house and did not contribute to the sharing organization. Thus the earliest form of protection for computer programs was secrecy as less thought was given to other forms of protection.[191]

This situation continued till the emergence of the independent program industry in the late 50s and the early 60s.[192] This industry, represented by the program supply houses, provided customized or general purpose programs for a fee which could cover their development cost and incur profits.[193] This placed the computer programs in the commercial marketplace as valuable property. It was estimated that computer programs were being written at a rate of 10,000 per day.[194] Thus, as more and more computer program companies started to originate, the computer program developers started to raise concern regarding legal protection for computer programs.

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[189] *Ibid.*

[190] *Ibid.*

[191] *Nimtz, supra* note 8 at 8.

[192] *Ibid.*

[193] *Ibid.*

[194] *Ibid.*

This growing concern and the growing value of computer program market, led to government of various countries to undertake appropriate legal protection for computer programs.[195] As the computer hardware industry was being protected under patent laws, the computer program industry raised concerns regarding granting of an equal legal treatment for computer programs.

[195] In 1971 the total worth of international software market was estimated at $24 billion. Maureen Murphy Lauran Neil Gasaway, *Legal Protection for Computer Programs* (Colorado,USA: CAUSE Publications, 1980) at 1.

Chapter Three: Development of Computer Program Protection in Canada and India

3.1. Before 1981

As seen in Chapter 2, when computers were being built the main focus of the developers was on the hardware component of the computers.[196] Each computer was being built to do one kind of calculation and to change the method of calculation the computer had to be physically altered.[197] However, computer programs were being developed during this period but they were only being created specifically for an organization for their own unique internal processes and procedures and were of little or no use to any other organization.[198] Thus legal protection of computer programs was not a serious concern during the early period of computer technology. Computer programs were seen more as business and industrial tools rather than items of property capable of being commercially exploited.[199]

Although computer programs were being developed in universities and government institutions in Canada, India and other countries, the question of legal protection only became an issue when reprogrammable computers began to be produced in the 1970s.[200]

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[196] Refer 2.2 Computer Program.

[197] *Nimtz, supra* note 8 at 7.

[198] David Bainbridge, *Legal Protection of Computer Software* (West Sussex: Tottel Publishing, 2008) at 8.

[199] *Ibid.*

The growing demand for computers by the public also demanded a wide variety of programs that could be used on these machines. Thus this growing demand for computer programs led to the formulation of a separate and distinct industry known as the software industry. As there was no concrete legal protection for computer programs, the software businesses and companies kept the computer programs as a secret.[201]

Keeping computer programs as a secret can be helpful, but it has its own drawbacks. As software businesses started to flourish the computer program developers started to move from one employer to another or to form, either alone or in conjunction with other former employees, another company to compete with other computer program developers, in their area of expertise.[202] Due to the intangible and ephemeral nature of the knowledge of computer programs, use of information by computer program developers after their employment ceased or disclosure to third parties started to rise. Thus to protect the knowledge of computer programs, software businesses and software companies voiced concern regarding the need for a proper legal protection for computer programs. Another reason which further increased the need to legally protect computer programs was the creation of the internet in 1980.[203] Internet had broken down the trade barriers.[204] With

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[200] G.P.V. Vandenberghe, Bescherming van computer software(diss.), Antwerpen (1984) in Madeleine de Cock Buning, "The History of Copyright Protection of Computer Software" in Karl de Leeuw and Jan Bergstra, *The History of Information Security: A Comprehensive Handbook*, (Elsevier B.V., 2007) at 123.

[201] *Nimtz, supra* note 8 at 8.

[202] Barry B. Sookman, "Protecting Intellectual Property Rights in Computer Products and Related Technology" in Gerorge S. Takach, *The Software Business in Canada-Financing, Protecting and Marketing Software* (Whitby,Ontario: McGraw-Hill Ryerson Limited, 1997) at 106. [*Sookman*]

[203] Barry M. Leiner, Vinton G. Cerf, David D. Clark, Robert E. Kahn, et al, "A brief history of the Internet" (2009) 39:5, ACM SIGCOMM Computer Communication Review 22 at 26.

the help of the internet, computer programs could be transferred from one computer to other computers. This resulted in computer programs being transferred between not only computers in the owner's country but also other countries. Thus a legal protection was required for computer programs which could protect them in other jurisdictions also.

Before a proper legal protection was granted to computer programs, computer program developers started availing themselves of other types of legal protection i.e. criminal law and trade secret laws.[205] Under criminal law, computer program developers started invoking legal grounds such as 'Theft' and 'Fraud' to protect computer programs.[206] However these legal grounds being confined to a single jurisdiction resulted in inadequate protection for computer programs as the computer program developers could not prosecute computer program users who were beyond their jurisdictions. Another drawback of criminal law was that the state could only invoke these legal grounds against the infringers. Thus the computer program developers could not enforce these legal grounds on their own and required an approval from the prosecutor.

The other form of legal protection that computer program developers relied upon was a common law principle of trade secret/breach of confidence.[207] This protection was

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[204] *Ibid.*

[205] In Canada the *Criminal Code*, R.S.C. 1985, c. C-46 states the provisions for criminal offences. In India the *Code of Criminal Procedure*, 1973, 2 of 1974 and *the Indian Penal Code*, 1860, 45 of 1860 states the provisions for criminal offences.

[206] Section 322(1) of the Canadian *Criminal Code*, R.S.C. 1985, c. C-46 and Section 378 of *the Indian Penal Code*, 1860, 45 of 1860 deal with theft. Section 380(1) of the Canadian *Criminal Code*, R.S.C. 1985, c. C-46 and Section 463 of *the Indian Penal Code*, 1860, 45 of 1860 deal with fraud.

particularly attractive to many computer program developers because no administrative formalities were required to obtain a trade secret and the protection extended indefinitely for as long as the information remained confidential.[208] Furthermore, under the trade secret laws, when employed, an employee has a duty of good faith or a duty of fidelity to his or her employer.[209] This duty is reflected in four main obligations that subsist during the employment:

- The employee is bound not to disclose, or to use for purposes that are inimical to his or her employers' interests, confidential information received by him or her in his capacity as an employee.
- The employee must not compete with his or her employer during the term of the employment relationship.

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[207] There is no Canadian federal or Indian legislation on trade secret law. It is a common law principle applied by India and Canada. In general, trade secrets consists of any information including but not limited to a formula, pattern, compilation, program, method, technique, or process that is or may be used in a trade or business, that is not generally known in that trade or business, that has economic value from not being generally known, and that is the subject of efforts that are reasonable under the circumstances to maintain the secrecy of the information. To be recognised as a trade secret, neither novelty nor complexity is required. They may exist in a method, idea or process and the protection continues for as long as the trade secret is left as a secret.
One possible definition that one might look into to understand what is trade secret is in the proposed *Uniform Trade Secrets Act* adopted by the 1989 Uniform Law Conference of Canada, which reads as follows:

> "*trade secret*" means any information that:(a) is, or may be, used in a trade or business, (b) is not generally known in that trade or business, (c) has economic value because it is not generally known, and (d) is the subject of efforts that are reasonable under the circumstances to prevent it from becoming generally know.
> (2) For the purposes of the definition trade secret "information" includes information set out, contained or embodied in, but not limited to, a formula, pattern, plan, compilation, computer program, method, technique, process, product, device or mechanism.

[208] *Sookman, supra* note 202 at 105.

[209] *Ibid.* at 106.

- The employee is bound to disclose to his or her employer valuable information that he or she receives by virtue of his or her being an employee and that is unknown to his or her employer.
- After termination of the employment the employee cannot disclose information to third parties which during the course of employment would be a breach of duty of good faith.[210]

Although the law is easy to state, it is extremely difficult to determine which information known by a former employee may be used after the employment. This issue is particularly difficult in the context of a computer program developer, as the former employee's knowledge of the employer's trade secret can be imitated, with the consequence that the employer can claim that such knowledge is highly confidential and require it to be protected as a trade secret.[211] Employees, on the other hand, can assert that their knowledge of the previous employer's technology has become a part of general skill and expertise and is therefore free to use after the employment has ceased.[212] Another drawback of trade secret laws is that it is difficult to impose confidential relationship on users who had access to the secret. In a free flowing industry such as a software industry, this was all the more difficult.[213]

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[210] *Ibid.* at 107.

[211] *Ibid.*

[212] *Ibid.*

[213] *Ibid.*

Though both the above legal protections are still available for computer programs, they do not protect computer programs adequately. Thus the need to protect computer programs under a separate and complete law was the need of the hour. As computer hardware was being protected under intellectual property laws, computer program developers propounded the use of similar laws to adequately protect computer programs.

3.1.1. Patents

To overcome the lack of legal protection available for computer programs, developers started looking at alternative forms of legal protection. As computer hardware was being protected under patent laws, developers propounded that computer programs should also be protected under the same law. Furthermore the technical nature of the computer program further demonstrated to some legal scholars that patent laws are the most appropriate mean to protect computer programs.[214] This led to an initial upholding of a patent for "Counting Predetermined Bits in a Data Word" in *Re Application Number 961,392 (Waldbaum)*[215] by the Canada Patent Appeal Board and Commissioner of Patents. The Patent Appeal Board held that claims to a new method of programming a computer are patentable;[216] and claims to a computer programmed in a novel manner are patentable.[217] On the other hand, the Economic Council of Canada in its Report on Intellectual and Industrial Property reached a conclusion that patent protection for

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[214] R.W. Wild, "Computer Program Protection: the need to legislate a solution" (1969) 54 Cornell Law Review 586 at 590.

[215] *Re Application Number 961,392*, 5 C.P.R. (2d) 162 (1971). [*Waldbaum*]

[216] *Ibid.* at 40.

[217] *Ibid.*

computer programs would not be appropriate.[218] This was also reflected in the departmental working paper on patent law revision, which read as, "All avenues for obtaining patent rights over computer programming techniques will be closed."[219] These divergent conclusions led to confusion regarding patenting of computer programs in Canada.

Finally this confusion was laid to rest by the Patent Appeal Board and Commissioner of Patents in *Re Application Number 096,284*,[220] which dealt with an appeal application regarding grant of a patent on

> A method of seismic exploration in which acoustic signals are generated, reflected from subsurface interfaces, and then detected. The detected acoustical signals are translated into electric signals which are then processed to a convenient form using automatic computing apparatus.[221]

The examiner came to the conclusion that patent could not be granted. He pointed out that the precedent set by *Re Application Number 961,392 (Waldbaum)*[222] was incorrect as it was based on the U.K. jurisprudence even though the *Canadian Patent Act* is not modelled after the *British Act*.[223] Furthermore the examiner pointed out that the U.S.

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[218] Economic Council of Canada, Report on Intellectual and Industrial Property, Information Canada (Ottawa: Economic Council of Canada, January 1971) at 103. [*1971 EC Report*]

[219] Department of Consumer and Corporate Affairs, Working Paper on Patent Law Revision (Ottawa: Department of Consumer and Corporate Affairs, June 1976) at 180.

[220] *Re Application Number 096,284*, 52 C.P.R.(2d) 96 (1978). [*App No. 096284*]

[221] *Ibid.* at 1.

[222] *Waldbaum, supra* note 215.

[223] *App No. 096284, supra* note 220 at 21.

cases relied upon for adjudging *Re Application Number 961,392 (Waldbaum)*[224] had been overruled due to the decision in *Gottschalk v. Benson.*[225] Thus after going through the claims in the application and upon hearing the arguments the commissioner agreed upon the recommendations of the appeal board and refused to grant a patent on the application.[226]

An important aspect of this appeal was that the examiner laid down certain guidelines, which as per him, the Commissioner of Patents should adopt for future computer program related patent applications, as it took into account the developments of legal jurisprudence since *Re Application Number 961,392 (Waldbaum).*[227] The guidelines were:

a) Claims to a computer programme *per se* are *not* patentable;
b) Claims to a new method of programming a computer are *not* patentable;
c) Claims to a computer programmed in a novel manner, *expressed in any and all modes*, where the novelty lies solely in the programme or algorithm, are *not* directed to patentable subject-matter under s. 2 of the *Patent Act*;
d) Claims to a computing apparatus programmed in a novel manner, where the patentable advance is in the apparatus itself, are patentable; and
e) Claims to a method or process carried out with a specific novel apparatus devised to implement a newly discovered idea are patentable.[228]

These guidelines as laid down in *Re Application Number 096,284*[229] were accepted by the Patent Office and no patents were granted to computer programs until 1981. Thus in

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[224] *Waldbaum, supra* note 215.

[225] *Gottschalk v. Benson*, 409 U.S. 63(1972). Also see *App No. 096284, supra* note 220 at 15.

[226] *App No. 096284, supra* note 220 at 51.

[227] *Ibid.* at 41.

[228] *Ibid.*

[229] *App No. 096284, supra* note 220 at 51.

Canada before 1981, patenting of computer programs was not permissible under the *Canadian Patent Act*.

Looking at India, the first computer that touched the Indian soil was towards the end of 1955.[230] The HEC-2M was made at Birk Bak College in United Kingdom and shipped to India to be used for research and analysis by the Indian Statistical Institute.[231] The second computer that came to India was under the name of URAL was bought by India from Russia with a grant from United Nations Technical Assistance Board (UNTAB).[232] These computers laid the foundation for making the first computer TIFRAC,[233] which was made in India in 1960.[234] These computers were only used for research purposes and did not have wide variety of computing abilities. Thus as the main focus of the computer scientist was on the mainframe computers, thus neither the need nor the desire was there to protect computer programs.

It is difficult to find out the exact period when personal computers and computer programs became available in Indian market; however one can be certain that they were

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[230] Subroto Bagchi, "The First Computer Comes to India" (January, 1985) Dataquest at 46. Online: < http://dqindia.ciol.com/content/50yrsIT/Trailblazers/2006/106123002.asp>. (Last visited 6.07.2010)

[231] *Ibid.* The HEC-2M was a 16-bit machine with 16 instructions. It operated on machine code with its drum memory of 1024 words. It had a 32 bits registers. It did not have a printer or a tape. It used punched cards and gave out punched cards.

[232] *Ibid.* It had a 32-bit word size, a horizontal mag tape, a punched celluloid tape and 2 kb of memory.

[233] TIFRAC, Tata Institute of Fundamental Research Automatic Calculator.

[234] PVS Rao, "TIFRAC, India's First Computer-A Retrospective" (May 2008) Resonance 420 at 421.

protected under the *Indian Penal Code*[235] before the *Indian Patent Act* brought computer programs under its purview. Under the *Indian Penal Code*, criminal provisions such as theft and fraud were used to protect computer programs.

Though the *Indian Patent Act* was formulated in 1970, it did not consider computer programs under its purview, as computer programs were not considered as inventions under the Act. Furthermore no explicit reference to computer programs was contained in the *Indian Patent Act*. Thus no one claimed patent protection in the Indian courts and no application for patents came before the Patent Office which specifically dealt with computer programs.[236] The only way to protect computer programs was under the provisions of the *Indian Penal Code*. [237]

Comparing both Canada and India, we can conclude that before 1981, the computer programs were considered unpatentable in both jurisdictions. Canadian courts had adjudged upon a patent application for computer programs and concluded that Canada does not support patent protection for computer programs. On the other hand, in India neither the need nor the desire to protect computer programs under patent laws was felt as the computer industry was only at its initial stage and were satisfied with the provisions of the *Indian Penal Code* to protect computer programs.

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[235] *The Indian Penal Code*, 1860, 45 of 1860.

[236] A.B. Rajasekaran, "Patents for Computer-Related Invention in India" (2005), Indian Patent Office. Online:< http://www.intelproplaw.com/Articles/cgi/download.cgi?v=11143862444>. (Last visited: 8.07.2010). [*Rajasekaran*]

[237] Section 378 of *the Indian Penal Code*, 1860, 45 of 1860, deals with theft and Section 463of *the Indian Penal Code*, 1860, 45 of 1860, deals with fraud. These provisions were used to protect computer programs.

3.1.2. Copyrights

The lack of appropriate guidelines relating to patenting of computer programs, as seen above, led to the demand for an appropriate protection for computer programs in Canada. The alternative to patent protection for computer programs was copyright protection.

However, in Canada, before 1981 no explicit reference to computer program was contained in the *Canadian Copyright Act*. Considerable doubts existed as to whether computer programs could be protected under *Canadian Copyright Act*.[238] In the early days of this dispute, the *Economic Council of Canada* recommended that Canada should not take:

> Any sort of world lead in extending patent or copyright protection to computer program at this time. But even if other countries did extend such protection, there might still be good practical reason for Canada not to follow them.[239]

The Council cautioned that:

> We would not consider as increases in basic levels of protection or simple lateral extensions of existing incentives purely to take account of the appearance of new media of information-processing, but we recommend that this be done very carefully, with no hidden or partly hidden basic extension of copyright—for example, into the protection of ideas as such, supplementary to the traditional protection of idea-expression. Certain copyright problems relating to computers and computerized information systems are likely to be extremely tricky in this regard.[240]

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[238] *Sookman, supra* note 202 at 112.

[239] *1971 EC Report, supra* note 218 at 103.

[240] *Ibid.* at 144.

Even though the Economic Council Report voiced words of caution relating to protection of computer programs under copyright law, the report agreed that protection for computer programs was the need of the hour. The Economic Council stated:

> On the basis of current level of activity, particularly on the production side, this would hardly seem to be a sector of the total information system standing in great need of state-provided incentives in the form of patent or copyright protection.[241]

Thus in Canada, it was felt that there was an immediate need to protect the growing software industry.

Following the Economic Council Report, A.A. Keyes and C. Brunet voiced their concern regarding copyright protection for computer programs.[242] They published a paper on *Copyright in Canada-Proposals for a Revision of the Law* in which they suggested that the present *Canadian Copyright Act* should be amended and computer programs should be brought explicitly under its purview.[243] They recommended that:

a) Computer programs *per se* should not be protected under copyright law.

b) In case computer programs fall under existing categories of protected material, computer programs embodied in that material be accorded the protection attached to those categories.

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[241] *Ibid.* at 101.

[242] C. Brunet A.A. Keyes, *Copyright in Canada-Proposals for a Revision of the Law* (Canada: Consumer and Corporate Affairs Canada, April 1977). [*Keyes*]

[243] *Ibid.*

c) It should be specified in the infringement action of the *Canadian Copyright Act* that nothing in the Act prevents the use of computer programs to operate a computer.[244]

One important recommendation that the two authors gave was that a special type of protection should be maintained for computer programs. This dilemma of protecting computer programs can be resolved by treating the computer programs according to the use to which they are put.[245]

Thus in Canada, before 1981, there was no protection for computer programs under the *Canadian Copyright Act*. The only protection that was available for computer programs was under the provisions of the *Canadian Criminal Code*.[246]

In India, as seen above, the main focus of the computer scientists was on the mainframe computers which had few computing abilities, thus neither the need nor the desire was there to protect computer programs.[247] However the general view was that in case any protection was required for computer programs, the provisions of the *Indian Penal Code* were adequate to protect them.[248]

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[244] *Ibid.*

[245] *Ibid.*

[246]Section 322(1) of the Canadian *Criminal Code*, R.S.C. 1985, c. C-46, deals with theft and Section 380(1) of the Canadian *Criminal Code*, R.S.C. 1985, c. C-46 deals with fraud. These provisions were used to protect computer programs.

[247] *Supra* note 220 to 224.

However, the *Indian Copyright Act* was formulated in 1957; it did not consider computer programs under its purview, as computer programs were not considered as literary works under the Act. Furthermore no explicit reference to computer programs was also contained in the *Indian Copyright Act*. Thus no such case came before the Indian courts which specifically dealt with computer programs.[249] The only way to protect computer programs, before 1981, was under the provisions of the *Indian Penal Code*.

Comparing both Canada and India, we can conclude that before 1981, computer programs were considered not copyrightable in both the jurisdictions. While Canadian legal scholars had voiced concerns regarding bringing computer programs under the ambit of copyright laws, in this period neither the Canadian Courts nor the Canadian legislature undertook any actions to bring computer programs under the *Canadian Copyright Act*. Thus having no appropriate protection, computer programs were protected only under the *Canadian Criminal Code*. On the other hand, in India neither the need nor the desire to protect computer programs under copyright laws was felt as the computer industry was only at its initial stage and were satisfied with the provisions of the *Indian Penal Code* to protect computer programs.

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[248] *Supra* note 237.

[249] *Rajasekaran, supra* note 236.

3.1.3. Conclusion

Thus to conclude, before 1981, in both Canada and India, computer programs were not protected under patent or copyright laws. They were only protected under the provisions of their respective criminal law. However there was a need to protect computer programs under the intellectual property laws because USA had started granting copyrights to computer programs in 1980.[250] Thus in order for the Canadian and the Indian software market to remain in competition, the need of the hour required computer programs to be protected under the intellectual property rights.

3.2. 1981 -2001

3.2.1. Patents

After 1981, two divergent approaches were applied to protect computer programs under the patent laws of Canada. The first approach dealt with protection of computer programs in inventions and the second approach dealt with protection of computer programs in business methods.

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[250] The USA legislature on the recommendation of the national committee on New Technological Uses of Copyrighted Works (CONTU) incorporated the Software *Copyright Act* of 1980 which changed the *Copyright Act* of 1976 and categorized computer programs as 'literary works' under 102(a)(1).

First approach:

As discussed earlier, that computer programs should not be patentable[251] the Canadian Federal Court of Appeal in 1981 again considered the patentability of computer programs in *Schlumberger Canada Ltd. v. Commissioner of Patents*.[252] Claims in this appeal dealt with an invention to facilitate the exploration of oil and gas.[253] The exploration was made by drilling boreholes through geological formations likely to contain hydrocarbons and by passing instruments up and down these boreholes to take various measurements of the characteristics of the soil.[254] The inventor claimed that such measurements can be combined and analyzed so as to yield more meaningful information.[255] The application further disclosed a process whereby the measurements obtained in the boreholes were recorded on magnetic tapes then transmitted to a computer, and programmed according to a mathematical formula, set out in the specifications. These measurements were further converted by the computer into useful information in human readable form such as charts, graphs or tables of figures.[256] The applicant claimed that the above stated program was a part of the overall process and thus patentable under the *Canadian Patent Act*.[257] The Court, after hearing the claims, rejected the application and stated that:

> There is nothing new in using computers to make calculations of a kind that are prescribed by the specifications. It is precisely in order to make those kinds of

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[251] Refer 3.1. Before 1981.

[252] *Schlumberger Canada Ltd. v. Commissioner of Patents* (1981) 56 C.P.R.(2d) 204. [*Schlumberger*]

[253] *Ibid.* at para 2.

[254] *Ibid.*

[255] *Ibid.*

[256] *Ibid.*

[257] *Ibid.* at para 4.

> calculations that computers were invented. What is new here is the discovery of the various calculations to be made and of the mathematical formulae to be used in making those calculations. If those calculations were not to be effected by computers but by men, the subject-matter of the application would clearly be mathematical formulae and a series of purely mental operations; as such, in my view, it would not be patentable.[258]

Although the Canadian Federal Court of Appeal rejected the above application, it did not lay down any specific guidelines to assist the Patent Office to determine which computer program related inventions are patentable under the *Canadian Patent Act.* However, the court held that there is nothing in the *Canadian Patent Act* that excluded inventions involving computers.[259] It also ruled that the fact that a computer, used to implement a discovery, does not change the nature of that discovery for patent purposes[260] and each application must be considered separately to determine exactly what, according to the application, has been discovered.[261]

After *Schlumberger,*[262] in *Re Application for Patent of General Electric*[263] the Patent Appeal Board and Commissioner of Patents adjudged upon a patent application which dealt with an invention wherein a computer program was used as a part of a large engine control system. The court relied on *Schlumberger* and concluded that:

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[258] *Ibid.* at para 5.

[259] *Ibid.*

[260] *Ibid.*

[261] *Ibid.*

[262] *Schlumberger, supra* note 252.

[263] *Re Application for Patent of General Electric (Now Patent No. 1,188,775)* (1984) 6 C.P.R. (3d) 191. [*General Electric*]

> The calculated numbers, i.e., the control parameters, in this application are not the product or end result of the operation but rather are parameters to be used within a system of controlling an engine. In comparison, to *Schlumberger* the measured data were recomputated and plotted for interpretation by an operator. Applicant's system, however, produces an end result which is more than a mere calculation. It produces a control system for an engine. We find that the combination performs a function, for which the patent laws were designed to protect, thus the subject-matter falls into the statutory subject-matter category of Section 2 of the *Canadian Patent Act.*[264]

Thus, this case followed the *Schlumberger*[265] decision and ruled that inventions involving computer programs can be patented under the *Canadian Patent Act.*[266]

Following the *Application for Patent of General Electric*[267] the Patent Appeal Board and Commissioner of Patents started upholding patents for inventions involving computer programs.[268] Indeed, after the *Schlumberger*[269] and *Application for Patent of General Electric*[270] the Canadian Patent Office started allowing patent applications that consisted largely of computer programs, particularly where they were artfully and skilfully drafted to be included in some hardware elements. So long as the claims did not focus upon stand

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[264] *Ibid.* at para 9.

[265] *Schlumberger, supra* note 252.

[266] *General Electric, supra* note 263.

[267] *Ibid.*

[268] After the *Application for Patent of General Electric*, the Patent Appeal Board and the Commissioner of Patents upheld patents in *Re Application of Vapor Canada Ltd (Now Patent No. 1,203,625)* (1985) 9 C.P.R. (3d) 524, *Re Application of Fujitsu Ltd (Now Patent No. 1,200,911)* (1985) 9 C.P.R. (3d) 475 and *Re Application of Honeywell Information Systems Inc. (Now Patent No.1,216,072)* (1986) 13 C.P.R. (3d) 462. All these appeals dealt with patent applications for inventions involving computer programs. The Patent Appeal Board and Commissioner of Patents relied upon *Application for Patent of General Electric* and *Schlumberger* and concluded that inventions involving computer programs can be patented under the *Canadian Patent Act.*

[269] *Schlumberger, supra* note 252.

[270] *General Electric, supra* note 263.

alone algorithms but referred to systems, processes, or methods to achieve a concrete solution, the Canadian Patent Office granted patents to them.[271]

To further uphold the patentability of inventions involving computer programs the *Patent Examination Branch* of the Canadian Patent Office in 1993 developed a set of guidelines to reflect the views of the Patent Office.[272] These guidelines were further revised following a proposal submitted by the *Patent and Trademark Institute of Canada* in July 1994.[273] The Patent Office and Patent Profession Committee agreed upon the following set of guidelines:[274]

a) Unapplied mathematical formulae are considered equivalent to mere scientific principles or abstract theorems and are not patentable under section 27(3) of the Canadian Patent Act.

b) The presence of a programmed general purpose computer or a program for such computer does not lend patentability to, nor subtract patentability from, an apparatus or process.

c) It follows from above, that new and useful processes incorporating a computer program, and apparatus incorporating a programmed computer, are directed to patentable subject matter if the computer-related matter has been integrated with another practical system that falls within an area, which is traditionally patentable.

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[271] *Takach, supra* note 108 at 136.

[272] *Sookman, supra* note 202 at 126.

[273] *Ibid.*

[274] Canadian Intellectual Property Office, The Patent Office Record, "Notice 16", Vol.123, No.8, 21 February 1995.

Thus following these guidelines it was settled by the Canadian Patent office that computer program related inventions are patentable and computer programs *per se* are not patentable under the *Canadian Patent Act.*

Second Approach

While the cases in the previous section demonstrated the patentability of inventions involving computer programs, at the same time a second approach relating to computer programs in business methods was developing. However, the Canadian Patent Office was not as enthusiastic about this approach as they were about issuing patents to inventions involving computer programs. A number of practitioners believed that the Federal Court of Appeal in Canada would uphold a business method patent if one came before it as U.S. Patent Office was upholding business method patents.[275] The practitioners relied on the

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[275] After the *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*,149 F.3d 1368(1998); 1998 U.S. App. LEXIS 16869; 47 U.S.P.Q.2D (BNA) 1596; U.S. Patent Office started issuing patents for business methods.
Although the law prior to *State Street* was unclear, many patent attorneys and business had concluded that the law prohibited patents on business methods because they constituted abstract ideas or failed to fall within the useful arts. In this case, the claim in the dispute was directed to a data processing system for managing a financial services configuration of a portfolio established as partnership, each partner being one of a plurality of funds, a kind of a meta-mutual fund. The claim defined the data processing system in terms of a set of functions to be performed for updating share prices in the meta-mutual fund.
After adjudging on the facts, the court concluded that the claims constituted a machine which is patentable subject matter under 101 of the *Patent Act*. Furthermore the court stated that the claim fell into one of the two judicially created exceptions to patentable subject matter i.e. mathematical algorithm exception and the business method exception. The mathematical algorithm exception stated that mathematical subject matter is non-patentable subject matter to the extent that they are merely abstract ideas. Certain kinds of mathematical subject matter the court concluded could constitute patentable subject matter if they produce a useful, concrete and tangible result. Thus the court held that the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces "a useful, concrete and tangible result"-a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades.
The court also eliminated the business method exception by announcing that it had never really existed, at least in practice. The court stated: we take this opportunity to lay this ill-conceived exception to rest. Since its inception, the "business method" exception has merely represented the application of some general, but no longer applicable legal principle, perhaps arising out of the "requirement for invention"-which was eliminated by § 103. Since the 1952 *Patent Act*, business methods have been, and should have been, subject to the same legal requirements for patentability as applied to any other process or method.

similarity between the definition of 'invention' in Canadian and U.S. patent laws and concluded that Canadian courts would also uphold a business method patent.[276] However no case came before the Canadian courts in this period which could clarify this situation.

The foregoing cases demonstrate that, during this period, in Canada, it was settled that computer program related inventions are patentable and computer programs *per se* are not patentable under the *Canadian Patent Act*. As regard to computer program in business methods, the legislature and the Canadian courts were silent whether these inventions can be patented under the *Canadian Patent Act*.

In India, during this period, not much development took place relating to patenting of computer programs. The Indian Patent Office and the legislature did not take out any guidelines nor did they amend the *Indian Patent Act* to include computer programs even after seeing thousands of patent applications relating to computer program related inventions being filed in Canada and other countries.[277] One reason for this could be that the Controller General of Patent, Design and Trademark did not take any application nor

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Thus the ruling of *State Street* concluded that business methods were not *per se* excluded from patentability. This caused uproar and many patent applications for business methods started flooding in the U.S. Patent and Trademark Office. Moreover, following this decision in 1999 *AT&T Corp. v. Excel*, 172 F.3d 1352 (1999); 1999 U.S. App. LEXIS 7221; 50 U.S.P.Q.2D (BNA) 1447, the dephysicalization of these business process patents got complete. This case concluded that business process patents are not limited to patents involving machine claims but also to business process patents involving process claims. These decisions have caused a flurry of patent applications aimed at software and internet-based business methods. Individual high profile business patents, such as 'Amazon.com-one click shopping patent' and 'Priceline's-reverse auction patent' and the 'Name your own price travel business reservation business model'- were given patents without any difficulty.

[276] *Takach, supra* note 108 at 140.

[277] Researching the Controller General of Patents Designs and Trademarks website revealed that no application involving computer programs was applied in the Patent Office, before 2001.
Online: < http://www.patentoffice.nic.in/ipr/patent/patents.htm> (Last visited: 8.07.2010)

commented on any application where computer programs were used.[278] Another reason could be that the Indian computer program industry was satisfied by the protection granted to their products under the *Indian Copyright Act* and the *Indian Penal Code*.[279]

The only major development that took place in this period was that India became a signatory to the *Trade Related aspect of Intellectual Property Rights* (TRIPS) agreement in 1994.[280] Thus to comply with TRIPS, India had been given ten years as transitional period to incorporate the TRIPS agreement in its domestic laws.[281] The first significant wave of amendments came in 1999,[282] followed by further amendments in 2002[283] and 2003.[284] Finally, India asserted by way of 2005 amendment[285] and 2006 amendment[286] that its patent laws are fully compliant with TRIPS. Only the 2002 amendment[287] deals with the computer programs, which will be dealt in detail in the next time period.

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[278] *Rajasekaren, supra* note 236.

[279] *Ibid.*

[280] Trade Related aspect of Intellectual Property Rights (TRIPS) agreement was signed on 15 April, 1994. Online: < http://www.wto.org/english/tratop_e/trips_e/t_agm0_e.htm>. (Last visited: 8.07.2010)

[281] *Ibid.*

[282] The *Patents (Amendment) Act, 1999* (No.17 of 1999), An Act further to amend the *Patents Act, 1970.* (Effective from the 1st January, 1995)

[283] *The Patents (Amendment) Act, 2002* (No.38 of 2002), An Act further to amend the *Patents Act, 1970.*

[284] *The* Patents Rules, 2003.

[285] *The Patents (Amendment) Rules, 2005* dated 28.12.2004 2004 (SO No. 1418).

[286] *The Patents (Amendment) Rules, 2005* dated 5.5.2006 (SO No. 657).

[287] *Supra* note 283.

Thus during this period, in India, the only development that took place was that India became signatory to the TRIPS agreement. However the *Indian Patent Act* did not consider patenting of inventions involving computer programs. The Controller General of Patent, Design and Trademark did not take any applications nor commented on any application where a computer program was used.[288] Thus the only way to protect computer programs was under the *Indian Penal Code* or the *Indian Copyright Act*.

Comparing both Canada and India, we can conclude that during this period, inventions involving computer program were considered patentable in Canada while the issue remained unaddressed in Indian courts. After *Schlumberger*[289] and *Application for Patent of General Electric,*[290] the Canadian Patent Office had started granting patents to inventions involving computer programs. However, on the other hand in India, inventions involving computer programs were considered unpatentable because the Controller General of Patent, Design and Trademark did not undertake nor commented on applications relating to computer programs. Thus there was no litigation in India which could challenge the provisions of the *Indian Patent Act* and bring computer programs under its ambit. The only way computer programs could be protected in India was under the *Indian Penal Code* and the *Indian Copyright Act*.

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[288] *Rajasekaren, supra* note 236.

[289] *Schlumberger, supra* note 252.

[290] *General Electric, supra* note 263.

3.2.2. Copyrights

In Canada, after an initial demonstration that patent laws were the appropriate way to protect computer programs, an interest in bringing computer programs under the purview of copyright laws started to increase.[291] This was due to the practical difficulties in applying patent laws to computer programs. In addition, it was a costly affair to acquire a patent, which was being used only by large software companies.[292] Thus, as a result of these difficulties, copyright law became an attractive alternative to protect computer programs.

In 1984 a government white paper named *From Gutenberg to Telidon* was published in Canada.[293] This white paper suggested that software should be divided into two categories. The first category proposed human readable computer programs. The second category proposed computer programs executed on a computer.[294] It proposed that the human readable form should be considered similar to other copyrightable works and be given the same term of protection as other copyrightable works.[295] For the second category i.e. software executed on computer, the term of copyright protection should be

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[291] *Wild, supra* note 214.

[292] *Buning, supra* note 138 at 124.

[293] Consumer and Corporate Affairs Canada, Department of Communications, From Gutenberg to Telidon, A White Paper on Copyright: Proposals for the Revision of the Canadian Copyright Act (Ottawa: Supply and Services Canada, 1984).

[294] *Ibid.*

[295] *Ibid.*

limited to five years only.[296] However this highly controversial proposal was not adopted by the subsequent parliament in 1985.[297]

Even though this proposal was not adopted by parliament, it brought to the notice of parliament that copyright protection can be given to computer programs. While a new proposals for protecting computer programs was being debated in the Canadian Parliament, the problem relating to protecting object code stored in Read Only Memory (ROM) silicon chips came in front of the Federal Court of Canada in two cases: *IBM Corp. v. Ordinateurs Spirales Inc.* (1984)[298] and *Apple v. Mac* (1986).[299] The first case dealt with an application for an interlocutory injunction to restrain the defendants from importing and selling computers containing the IBM BIOS[300] in Canada.[301] The court relied upon a number of cases from within Canada and Commonwealth countries and came to a conclusion that object code stored in ROM silicon chips are copyrightable under the *Canadian Copyright Act*.[302]

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[296] *Ibid.*

[297] House of Commons, Standing Committee on Communications and Culture, Report of the Sub-Committee on the Revision of Copyright: A charter of Rights for Creators (Ottawa: Supply and Services Canada, 1985).

[298] *IBM Corp. v. Ordinateurs Spirales Inc.* (1984), 2 C.I.P.R. 56 (Fed.T.D.). [*IBM*]

[299] *Apple Computers Inc. v. Mackintosh Computers Inc.* (1986), 28 D.L.R. (4th) 178 (Fed T.D.); varied (1987), 44 D.L.R. (4th) 74 (Fed. C.A.); affirmed, 30 C.P.R. (3d) 257 (S.C.C.). [*Mac*]

[300] BIOS, Basic Input and Output System.

[301] *IBM, supra* note 298.

[302] *Ibid.*

Similarly the *Apple v. Mac*[303] case came before the Federal Court of Canada, which also upheld that object codes stored in ROM silicon chips are copyrightable under the *Canadian Copyright Act*.[304] The court held:

> The circuitry in the silicon chip was both a translation and an exact reproduction of the assembly language program. As a result of this finding, the circuitry of the silicon chip was protected by copyright under s. 3(1) of the *Copyright Act*. Furthermore, the computer program in chip form might be protected under s. 3(1) (d), which protects the copyright holder's right to make any contrivance by means of which the work may be mechanically performed or delivered.[305]

As a result, we can conclude that Canadian Courts started recognising computer programs to be a subject matter under the *Canadian Copyright Act*.

Finally the legislature, in 1988, after keeping in mind the result of both the above cases and the proposal laid down in the white paper *Gutenberg to Telidon* amended the *Canadian Copyright Act* and provided an express protection for computer programs as literary works.[306] Now section 2 of the *Canadian Copyright Act* expressly stated that literary works included tables, computer programs and compilations of literary works.[307] Furthermore the act defined computer programs as "a set of instructions or statements, expressed, fixed, embodied or stored in any manner, that is to be used directly or indirectly in a computer in order to bring about a specific result."[308] The above definition

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[303] *Mac, supra* note 299.

[304] *Ibid.*

[305] *Ibid.* at para 10.

[306] Canadian *Copyright Act*, R.S.C. 1985, c. C-42 as amended by S.C. 1988, c. 65.

[307] *Ibid.*

[308] *Ibid.*

suggests that computer programs would be protected in a wide range of media; such as computer printouts, floppy disk, ROMS, CD-ROMS, punch cards, magnetic tapes, bubble memories and other tangible forms. [309] Documents printed or written forms, such as flow charts, specifications, designs would also be protected under the *Canadian Copyright Act* as literary or artistic works.[310]

After Canada had developed basic protection for computer programs under copyright laws, two new issues arose. These were (a) look and feel (b) reverse engineering.

The problem relating to the look and feel concept came before the Canadian courts in *Gemologist International Inc. v. Gem Scan International Inc.*[311] The court, relying on *Whelan's*,[312] acknowledged a broad scope of protection to computer programs. The court concluded that the defendant had copied the overall logical structure and sequence of menus of the plaintiff's computer programs.[313] This case was highly criticized by the computer program developers as it protected the computer program structure as a whole and in case a small part of structure or sequence is copied, it resulted in an infringement.[314]

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[309] *Sookman, supra* note 202 at 126.

[310] *Ibid.* at 114.

[311] *Gemologists International Inc. v. Gem Scan International Inc.* (1986), 7 C.I.P.R. 225 (Ont.H.C.J.). [*Gemologist*]

[312] *Whelan Associates Inc. v. Jaslow,* 797 F.2d 1222(1986); 1986 U.S. App. LEXIS 27796; 230 U.S.P.Q. (BNA) 481. [*Whelan*]

[313] *Supra* note 311.

[314] *Takach, supra* note 108 at 138.

Delrina Corp. v. Triolet Systems Inc.[315] came before the Ontario Court of Appeal in 1993 to clarify the above situation and adjudge upon the criticism of the computer program developers.[316] This case dealt with an action for an injunction to restrain the copying or use of a computer program.[317] In this case, the defendant who was a former employee of the plaintiff had created and marketed a computer program that was similar in function, appearance and operation to the plaintiff's computer program.[318] The court relied on the evidence presented by the plaintiff and pointed out that it was more probable in this case that, rather than copying the program, defendant had used his memory and experience to develop the computer program.[319] Furthermore the court stated that the defendant was not an officer of the plaintiff thus he owed no duty to the plaintiff.[320] Also the plaintiff cannot restrain the defendant from using his skills acquired or improved while working for the plaintiff, even if the skills acquired are to be used directly to compete in similar businesses.[321] Thus the court dismissed the application and stated that though the computer programs were similar, there was no copyright infringement in the present case.[322] Though this case resulted in no copyright infringement but the court accepted two important points. First, the court accepted that copying of parts of a computer program

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[315] *Delrina Corp. v. Triolet Systems Inc.* (1993), 47 C.P.R. (3d) 1 (Ont. Gen. Div.); affirmed (2002) 17 C.P.R. (4th) 289 (Ont. C.A.). [*Delrina*]

[316] *Ibid.*

[317] *Ibid.*

[318] *Ibid.*

[319] *Ibid.*

[320] *Ibid.*

[321] *Ibid.*

[322] *Ibid.*

other than the source code and the object code could lead to infringement.[323] Second, after a lengthy review of the *Altai*,[324] the court concluded that the abstraction-filtration-comparison method should be followed by the Canadian courts to separate protectable expression from unprotectable ideas in a computer program case.[325] The abstraction-filtration-comparison test stated that:

> In ascertaining substantial similarity under this approach, a court would first break down the allegedly infringed program into its constituent structural parts. Then, by examining each of these parts for such things as incorporated ideas, expression that is necessarily incidental to those ideas, and elements that are taken from the public domain, a court would then be able to sift out all non-protectable material. Left with a kernel, or possibly kernels, of creative expression after following this process of elimination, the court's last step would be to compare this material with the structure of an allegedly infringing program. The result of this comparison will determine whether the protectable elements of the programs at issue are substantially similar so as to warrant a finding of infringement.[326]

In lay man terms, the test stated three steps; first, abstraction (the infringed program was broken down into constituent structural parts); second, filtration (elements dictated by efficiency or by external factors, or taken from the public domain, were filtered out); and third, comparison (remaining protectable material was compared to the infringing program).[327]

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[323] *Ibid.*

[324] *Computer Associates International Inc. v. Altai Inc.,* 1992 U.S. App. LEXIS 14305; 23 U.S.P.Q.2D (BNA) 1241. [*Altai*]

[325] *Supra* note 315.

[326] *Altai, supra* note 324 at 36.

[327] *Ibid.* at 1.

On similar facts, *Matrox Electronic Systems Ltd v. Gaudreau*[328] came before the Quebec Superior Court in 1993.[329] In this case, Matrox Electronic Systems had applied for a permanent injunction against three of its former employees to stop them from illegally using confidential information of a computer program which the employees had obtained while they were employed with the plaintiff.[330] The computer program in question had been developed by the plaintiff to be used specifically for graphic designing.[331] The defendants had modelled their computer program on a similar idea, although they used different processes to get the same end result.[332] The defendant's computer program entered the market in direct competition with the plaintiff's computer program. The plaintiff argued that the defendants were in breach of their contract of employment.[333] The court, after extensively reviewing *Whelan*[334] and *Altai,* [335] came to the conclusion that the approach stated by *Altai*[336] is appropriate to be followed in the present case.[337] Furthermore the court upheld *Delrina*[338] and stated that copying of parts of a computer program other than the source code and the object code can lead to infringement under

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[328] *Matrox Eletronic Systems Ltd. v. Gaudreau,* (1993) R.J.Q. 2449 (Que. Sup. Ct.) [*Matrox*]

[329] *Ibid.*

[330] *Ibid.*

[331] *Ibid.*

[332] *Ibid.*

[333] *Ibid.*

[334] *Whelan, supra* note 312.

[335] *Altai, supra* note 324.

[336] *Ibid.*

[337] *Matrox, supra* note 328.

[338] *Delrina, supra* note 315.

the *Canadian Copyright Act*.[339] However, similar to *Delrina*,[340] it did not find any infringement in the present case.[341]

This conclusion was further upheld by British Columbia Supreme Court in *Prism Hospital v. Hospital Medical Records Institute.*[342] The court concluded that rewriting of a computer program from one computer language to another computer language, where there had been an extensive copying of the overall design, field, record, data structures, menu screens and the structure and sequence of execution, is an infringement under the *Canadian Copyright Act*.[343]

As noted above, the look and feel concept issue was only one of the two issues flowing from the copyrightablilty of computer programs. The second was reverse engineering. No Canadian courts had dealt with this issue during this period however several Commonwealth and American courts had suggested that reverse engineering could be infringing but in certain cases reverse engineering could be allowed.[344] However neither the Canadian legislature nor the Canadian courts commented on this issue.

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[339] *Matrox, supra* note 328.

[340] *Delrina, supra* note 315.

[341] *Matrox, supra* note 328.

[342] *Prism Hospital Software Inc. v. Hospital medical Records Institute* (1994), 57 C.P.R. (3d) 129 (B.C.S.C.). [*Prism*]

[343] *Prism, supra* note 342 .

[344] In USA after an initial setback in *Apple Computers Inc. v. Franklin Computer Corporation* 714 F.2d 1240; 1983 U.S. App. LEXIS 24388; 219 U.S.P.Q. (BNA) 113; which considered that software research is an infringement on the exclusive right of the rightful owner, the lower courts began cautiously to allow reverse engineering. Soon thereafter, the court in length discussed the possibility of reverse engineering in *Johnson v. Uniden* 623 F. Supp. 1485; 1985 U.S. Dist. LEXIS 12800; 228 U.S.P.Q. (BNA) 891 and stated

The foregoing cases demonstrate that, a lot of development relating to protection of computer programs under the copyright laws took place in Canada during this period. Finally, the Canadian legislature by way of 1988 amendment forwarded copyright protection to computer programs.[345] The amendment added computer programs under the category of literary works and defined a computer program.[346] Even though the law was settled, the Canadian courts further clarified the loop holes in applying copyright laws to computer programs. In *Delrina*[347] and *Matrox*[348] the Canadian courts started following the abstraction-filtration-comparison test as laid down in *Altai*[349] and forwarded that unprotected elements of computer programs should not be awarded copyright protection.

In India, during this period, the computer program industry was at its initial stage. Any computer programs that were being developed by the companies and businesses were

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that copying of computer program was a copyright infringement. Thus in case a person breaks down the computer program and then reprograms it, it would be held as a copyright infringement. However in *Sega v. Accolade* 977 F.2d 1510; 1992 U.S. App. LEXIS 26645; 24 U.S.P.Q.2D (BNA) 1561; the U.S. district court went a step further and propounded that the reproduction of a computer programs for the purpose of researching of unprotected elements in a computer programs was under the purview of the 'fair use' clause. Judge Reinhardt quoted: 'When the person seeking the understanding has a legitimate reason for doing so and when no other means of access to the unprotected elements exists, such disassembly is as a matter of law a fair use of the copyrighted work.'
Same result was held in *Atari Games v. Nintendo* 975 F.2d 832; 1992 U.S. App. LEXIS 21817; 24 U.S.P.Q.2D (BNA) 1015; 975 F.2d at 842; and the court forwarded that the exception stated in section 107 should be applied to computer programs and thus use of reverse engineering for the purpose of criticism, comments, teaching, scholarship.....research is not an infringement as it comes under the purview of the 'fair use' clause.
Thus *Sega v. Accolade* and *Atari Games v. Nintendo* opened up the path for later programmers to build a computer program by researching through reverse engineering and extracting the unprotected elements and then building a computer program without damaging the rightful interests of the rightful owner.

[345] *Supra note* 306.

[346] *Ibid.*

[347] *Delrina, supra* note 315.

[348] *Matrox, supra* note 329.

[349] *Altai, supra* note 324.

only being used for in house work. Thus computer programs were not targeting the commercial sector of India. Further as seen above,[350] computer programs were protected under the provisions of the *Indian Penal Code*, thus there was no requirement for protecting computer programs under other laws. However, due to globalization there was a need for a uniform framework of laws to protect inventions and literary works including computer programs. Thus to have a uniform framework of laws in all countries the *World Trade Organization* (WTO) proposed the enactment of the *Trade-Related aspect of Intellectual Property Rights* (TRIPS) agreement to the WTO member countries.[351] This agreement main aim was to reduce distortions and impediments in international trade by promoting an effective and adequate protection of intellectual property rights.[352] It further aimed to ensure that measures and procedures to enforce intellectual property rights do not themselves become barriers to legitimate trade.[353] This agreement was negotiated at the end of the Uruguay Rounds of the General Agreement on Tariffs and Trade (GATT) in 1994.[354]

TRIPS contained provisions for a minimum standard of protection to intellectual property and included computer programs to be regarded as literary works under the copyright

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[350] Refer 3.1.2. Copyrights

[351] Origins: into the rule based trade system, Trade-Related aspect of Intellectual Property Rights. Online:<http://www.wto.org/english/thewto_e/whatis_e/tif_e/agrm7_e.htm>. (Last visited 8.07.2010)

[352] Preamble, Trade-Related aspect of Intellectual Property Rights. Online:<http://www.wto.org/english/thewto_e/whatis_e/tif_e/agrm1_ehtm>. (Last visited 8.07.2010)

[353] *Ibid.*

[354] World Trade Organization. Online:<http://www.wto.org/english/thewto_e/whatis_e/tif_e/agrm7_e.htm>. (Last visited 7.07.2010)

laws. It further stated that computer programs should be given the same term protection as any other intellectual property.[355]

India being a member of the WTO signed the TRIPS agreement in 1994.[356] As a mandatory requirement, India had to incorporate the provisions of the TRIPS agreement in its domestic laws.[357] India being a developing country was given ten years to incorporate the provisions of TRIPS agreement in its domestic laws.[358] Thus in order to do so, the Indian legislature passed series of amendments which helped incorporate the TRIPS agreement into the Indian laws.[359] The Indian legislature ratified the *Indian Copyright Act* in 1994 and added the term computer programs under the category of literary works.[360] Section 2(o) of the *Indian Copyright Act* read as following:

> Literary works includes computer programmes, tables and compilations including computer databases.[361]

Furthermore, the definition of computer programs was added under Section 2 of the *Indian Copyright Act*. Section 2 (ffc) read:

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[355] Article 10 and 12 of Trade-Related aspect of Intellectual Property Rights agreement. Online:<http://www.wto.org/english/tratop_e/trips_e/t_agm3_e.htm#1>. (Last visited 8.07.2010)

[356]Members and Observers, Trade-Related aspect of Intellectual Property Rights. Online:http://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm>. (Last visited 8.07.2010)

[357] Article 1 of Trade-Related aspect of Intellectual Property Rights agreement. Online:<http://www.wto.org/english/tratop_e/trips_e/t_agm2_e.htm>. (Last visited 8.07.2010)

[358] Article 66 of Trade-Related aspect of Intellectual Property Rights agreement, Online: <http://www.wto.org/english/tratop_e/trips_e/t_agm7_e.htm>. (Last visited 8.07.2010)

[359] The Indian *Copyright Act* was amended in 1994 and 1999 to bring it in compliance with the Trade-Related aspect of Intellectual Property Rights agreement.

[360] *Copyright (Amendment) Act*, 1994 (38 of 1994).

[361] *Copyright Act, 1957* (14 of 1957) s. 2(o).

> Computer programme means a set of instructions expressed in works, codes, schemes or in any other form, including a machine readable medium, capable of causing a computer to perform a particular task or achieve a particular result.[362]

Thus in India, during this period, computer programs were finally granted copyright protection. Computer programs were granted the same term of protection as other intellectual properties. However, neither cases nor issues came before the Indian courts which specifically dealt with computer program infringement.

Comparing both Canada and India, we can conclude that during this period, computer programs were considered copyrightable in both jurisdictions. Canada being the first among the two granted copyright protection to computer programs by way of the 1988 amendment to the *Canadian Copyright Act*. Further, the Canadian courts in *Delrina* and *Matrox* clarified the problems in applying copyright laws to computer programs. On the other hand, in India, copyright protection to computer programs was given by way of the 1994 amendment to the *Indian Copyright Act*. However no cases came before the Indian courts relating to problem in application of copyright laws to computer programs.

3.2.3. Conclusion

To conclude, during 1981-2002, computer programs were protected differently in Canada and India. In Canada, computer programs were being protected under both patent and copyright laws, whereas in India, computer programs were being protected only under copyright laws. Further, though computer programs were being protected under Canadian patents laws, the Canadian courts had not clarified the position of protecting business

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[362] *Copyright Act, 1957* (14 of 1957) s.2(ffc).

method patents under the Canadian patents laws; however Canadian companies were pursuing patents for business methods in the United States.[363] Thus in order for the Canadian computer program developers to remain in competition, it was essential that business methods should be protected by the Canadian patent laws.[364]

Furthermore another issue that the Canadian courts had to adjudge upon in the future is the reverse engineering of computer programs. Several American courts had ruled that copying in the process of a legitimate reverse engineering activity constitute a fair use under the *U.S. Copyright Act*.[365] Canada also had similar provisions in its *Copyright Act* but it was not clear whether these provisions would be applicable to reverse engineering of computer programs.

On the other hand, India had just started protecting its computer program industry under copyright laws and had not adjudged upon cases relating to reverse engineering. Furthermore, the issue relating to patenting of inventions involving computer programs did not arise in India nor did the issue relating to patenting of business methods.

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[363] For example, U.S. Patent 5,890,138, issued to Bid.com International Inc., of Mississauga, Canada (now known as ADB System International).The patent covers an Internet-based auction system, and the patent shows as the two inventors Paul B. Gordin and Jeffery Lymburner Ethobicoke, both of Canada.

[364] After the *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*,149 F.3d 1368(1998); 1998 U.S. App. LEXIS 16869; 47 U.S.P.Q.2D (BNA)1596; U.S. Patent Office started issuing patents for business methods. Individual high profile business patents, such as 'Amazon.com-one click shopping patent' and 'Priceline's-reverse auction patent' and the 'Name your own price travel business reservation business model', were given patents without any difficulty.

[365] *Supra* note 344.

Thus, though a lot of development took place relating to protection of computer programs under the intellectual property laws, there was a further need for the legislature and the courts of Canada and India, to clarify the problems in application of patent and copyright laws to computer programs.

3.3. After 2002

3.3.1. Patents

The developments in Canada, after 2002, can be categorised under two headings. First, development of law relating to patenting of inventions involving computer programs and second, development of law relating to patenting of business methods.

Patenting of inventions involving computer programs

In Canada, *Schlumberger Canada Ltd*[366] finally confirmed that inventions involving computer programs can be patented under the *Canadian Patent Act*.[367] However computer programs *per se* were not patentable under the *Canadian Patent Act*. They were protected under the *Canadian Copyright Act*. To further confirm the patentability of inventions involving computer programs, the *Patent Examination Branch* of the Canadian Patent Office in June 1993 and the *Patent and Trademark Institute of Canada* in July 1994,

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[366] *Schlumberger, supra* note 252.

[367] *Ibid.*

issued guidelines which further confirmed that inventions involving computer programs are patentable under the *Canadian Patent Act*.[368]

To formalize the changes in the Canadian patent laws, the Canadian Patent Office in February 2005 revised the *Manual of Patent Office Practice (MOPOP)* and stated the Canadian Patent Office practice rules regarding inventions involving computer programs. One of the important amendments undertaken was that Section 12.04.05 of MOPOP was added which stated that computer programs would be considered statutory subject matter so long as they are integrated with traditionally patentable subject matter.[369]

In addition to this categorization of computer programs in Chapter 12, MOPOP introduced an entirely new Chapter 16 which dealt with computer implemented inventions.[370] Though Chapter 16 was solely a guide for the Patent Office, it expressed the Patent Office's interpretation on the Patent Act, Patent Rules and jurisprudence relating patenting of inventions. Some of the important features of the guidelines were:

a) Computer related subject matter is not excluded from patentability if the traditional criteria for patentability are satisfied.[371]

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[368] Canadian Intellectual Property Office, *The Patent Office Record*, "Notice 16," Vol.123, No.8, 21 February 1995.

[369] Chapter 12, Subject Matter and Utility, *Manual of Patent Office Practice*, 2005 version. Online:<http://www.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/eng/h_wr02208.html>. (Last visited 8.07.2010)

[370] Chapter 16, Computer Implemented Inventions, *Manual of Patent Office Practice,* 2005 version. Online:<http://www.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/eng/wr00999.html>. (Last visited 8.07.2010)

[371] *Ibid.* at 16.03.02.

b) Computer implemented inventions falling in the categories of art, process, machine, manufacture or composition of matter can be patentable.[372]

c) Software in the form of a data model or an algorithm is automatically excluded from patentability under subsection 27(8) of the *Patent Act*, in the same manner as a mathematical formula, and is considered to be equivalent to a mere scientific principle or abstract theorem.[373]

d) For a method to be considered an art under section 2 of the *Patent Act*, the method must be:

> an act or series of acts, performed by some physical agent upon some physical object and producing in such object some change of either character or condition; and
>
> It must produce an essentially economic result relating to trade, industry or commerce.[374]

e) The presence of a programmed general purpose computer or a program for such a computer does not lend patentability to, nor subtract patentability from, an apparatus or process.[375]

These guidelines as stated in the February 2005 version of MOPOP are still in place and are still being used by the Patent Office to assess any patent application that relates to inventions involving computer programs. However recently, Chapter 16 has been updated

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[372] *Supra* note 370.

[373] *Ibid.*

[374] *Ibid.*

[375] *Supra* note 370 at 16.03.03.

and a revised draft Chapter 16 has been released for public consultation until August 19, 2010.[376] This draft chapter further confirms the patentability of inventions involving computer programs.[377]

Patenting of Business Methods

Even though the law relating to patenting of inventions involving computer programs was in place, there was still no clear guideline or legislation regarding patenting of business methods.[378] The confusion can be summarised by looking at some of the conclusions drawn up by Canadian practioners:

Ferance: "... e-commerce methods and business method patents are patentable under existing jurisprudence."[379]

Eisen: "There is presently no clear basis for excluding the patentability of business methods in Canada."[380]

Simcoe: "... Business methods [in Canada] are not patentable *per se*, but some embodiments of business methods might be."[381]

Szibbo: "Canadian position is not yet clearly decided for business concept patents."[382]

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[376] Proposed changes to MOPOP-Chapter 16,Computer Implemented Inventions. Online:<http://www.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/eng/wr02486.html>. (Last visited 8.07.2010)

[377] *Ibid.*

[378] Refer 3.2.1. Patents.

[379] S. J. Ferance, "Debunking Canada's Business Method Exclusion Patentability" (2000) Canadian Intellectual Property Review 494-543.

[380] M.B. Eisen, "Arts and Crafts: The Patentability of Business Methods in Canada" (2000) Canadian Intellectual Property Review 179-291.

[381] Elliott S. Simcoe, "Filing Business Method Patent Applications in Canada; Applications corresponding to USPTO applications are being filed in Canada" February 28, 2002, Smart & Biggar, Ottawa.

Dimock and Eisen: "... business methods remain excluded from patentable subject matter [in Canada]."[383]

Furthermore, to add to this confusion, USA after *State Street*[384] was upholding business method patents and many Canadian companies started applying for patents for their business methods in USA.[385] However, it was believed by many legal scholars that the Federal Court of Appeal in Canada would uphold a business method patent if one comes before it.[386] Thus the Canadian position relating to business method patents was unstable and there was a need for the legislature or the Patent Office to clarify whether business methods are patentable under the *Canadian Patent Act*.

The first issue that came in front of the Canadian courts was whether business methods can be considered an *art* under the *Canadian Patent Act*. This issue was clarified in *Lawson v. Canada Commissioner of Patents.*[387] This application on appeal involved a claim for the method of subdividing parcels of land, so that the lots are divided into the shape of a champagne glass.[388] The issue that came before the Exchequer Court of

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[382] A.R. Szibbo, "The Global Challenge of the Business Method Patent" paper delivered to a conference of the Computer Law Association, Washington, May, 2001.

[383] R.E. Dimock, and M.B. Eisen, *The Patenting of Software and Business Methods in Canada*, paper prepared for an intellectual property conference, April 2002. (unpublished)

[384] *State Street Bank & Trust Co. v. Signature Financial Group, Inc.* 149 F.3d 1368(1998); 1998 U.S. App. LEXIS 16869; 47 U.S.P.Q.2D (BNA) 1596. [*State Street*]

[385] *Supra* note 363.

[386] *Takach, supra* note 108 at 140.

[387] *Lawson v. Commissioner of* Patents (1970), 62 C.P.R. 101 (Ex.Ct.). [*Lawson*]

[388] *Ibid.*

Canada was whether the term *art* in section 2 of the *Canadian Patent Act* included a method of describing the boundaries of subdivided land and whether lots divided into the shape of a champagne glass constitute an *art* or *manufacture* within section 2 of the *Canadian Patent Act*.[389]

Judge Cattanach articulated the now often cited definition of *art*:

> An art or operation is an act or series of acts performed by some physical agent upon some physical object and producing in such object some change either of character or of condition. It is abstract in that, it is capable of contemplation of the mind. It is concrete in that it consists in the application of physical agents to physical objects and is then apparent to the senses in connection with some tangible object or instrument.[390]

He further relied on an Australian case *National Research Development Corp. v. Commissioners of Patents*[391] to support the proposition that:

> Professional skills such as a surgeon performing a method of surgery, or a barrister practicing a method of advocacy are excluded from patentability.[392]

Applying the professional skills exception, the court concluded that a method of describing and subdividing land belongs to the professional fields of a solicitor, conveyancer, planning consultant and surveyor, and therefore it is not a manual art within the meaning of section 2 of the *Canadian Patent Act*.[393] A similar result was reached in

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[389] *Ibid.*

[390] *Ibid.* at para 30.

[391] *National Research Development Corp. v. Commissioners of Patents* (1960), [1961] R.P.C. 135, [1960] A.L.R. 114 (Australia H.C.) [*National Research*]

[392] *Lawson, supra* note 387at para 36.

[393] *Lawson, supra* note 387.

Tennessee Eastman[394] which dealt with a patent application for a method of closing surgical incisions.[395] Judge Kerr stated:

> In my view the method here does not lay in the field of manual or productive arts nor, when applied to the human body, does it produce a result in relation to trade, commerce or industry or a result that is essentially economic. The adhesive itself may enter into commerce, and the patent for the process, if granted, may also be sold and its use licensed for financial considerations, but it does not follow that the method and its result are related to commerce or are essentially economic in the sense that those expressions have been used in patent case judgments. The method lies essentially in the professional field of surgery and medical treatment of the human body, even although it may be applied at times by persons not in that field. Consequently, it is my conclusion that in the present state of the patent law of Canada and the scope of subject matter for patent, as indicated by authoritative judgments that I have cited, the method is not an art or process or an improvement of an art or process within the meaning of subsection (d) of section 2 of the *Patent Act*.[396]

Thus concluding from both these cases, we can conclude that a professional skill is not an *art* as defined by the *Canadian Patent Act* and the method is not patentable under the *Canadian Patent Act*.

Lawson[397] was again referred to, by the Supreme Court of Canada in *Shell Oil Co. v. Commissioner.*[398] This case related to patentability of a new use for an old compound and the patentability of new compositions containing the old compound plus a carrier to facilitate the new use.[399] While addressing the meaning of the term *art*, the Court stated:

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[394] *Tennessee Eastman Co. v. Canada (Commissioner of Patents),* [1974] S.C.R. 111. [*Eastman*]

[395] *Ibid.*

[396] *Ibid* at para 6.

[397] *Lawson, supra* note 387.

[398] *Shell Oil Co. v. Commissioner* [1982] 2 S.C.R. 536, 67 C.P.R. (2d) 1 (S.C.C.). [Shell]

[399] *Ibid.*

> Art was a word of very wide connotation and that it was not to be confined to new processes or products or manufacturing techniques but extended as well to new and innovative methods of applying skill or knowledge provided they produced effects or results commercially useful to the public.[400]

With reference to *Lawson*,[401] the court stated that the patent application in *Lawson* was rejected not because the associated subject matter was not an *art* within the meaning of the definition in the *Canadian Patent Act* but because it related to professional skills rather than to trade, industry or commerce. [402]

The Canadian Patent Appeal Board in *Re Patent Application No. 564,175*,[403] applied *Schlumberger*[404] and *Lawson*[405] to find out whether undertaking financial transaction with the help of a computer can be considered as an *art* or a professional skill.[406] Thi s application related to a personal financial system, incorporating means for implementing, coordinating, supervising, analyzing and reporting upon investments, in an array of asset accounts and credit facilities, within a client account.[407] The claimed system performed calculations based on formulae which were developed using the professional skills of

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[400] *Ibid* at para 9.

[401] *Lawson, supra* note 387.

[402] *Shell, supra* note 398.

[403] *Re Patent Application No. 564,175* (1999), 6 C.P.R. 4th 385 (PAB). [App No 564175]

[404] *Schlumberger, supra* note 252.

[405] *Lawson, supra* note 387.

[406] *App No 564174, supra* note 403.

[407] *Ibid.*

financial experts.[408] In the final action, the Examiner rejected the application as being directed to non-patentable subject matter, and stated:

> To be patented, the applicant must clearly show how by adding a computer to the system, new and unusual results are achieved that cannot be achieved by manual means. Consequently, if the system can be run manually, and it is also in the domain of traditionally non-patentable subject matter, then even with the computer, it is still unpatentable.[409]

On appeal, the Patent Appeal Board rejected the applicant's argument that the system could not run manually because of the complexity of the calculations required to determine the optimal distribution of funds on a continuous basis, for a large number of accounts.[410] The Board stated that the mere complexity of the calculations performed by the computer does not render the system patentable.[411] Thus the Patent Appeal Board reaffirmed that professional skills are not considered patentable subject matter in Canada.[412]

To further uphold that professional skills are not *art* under the *Canadian Patent Act*, the Federal Court in *Progressive Games, Inc. v. Commissioner of Patents*,[413] considered the patentability of an application named Poker Game, which was a modified version of a

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[408] *Ibid.*

[409] *Ibid.* at para 4.

[410] *Ibid.*

[411] *Ibid.*

[412] *Ibid.*

[413] *Progressive Games, Inc. v. Commissioner of Patents* (1999), 3 C.P.R. (4th) 517 (F.C.T.D.). [*Progressive Games*]

five-card stud poker game.[414] The only modification was that a new player called 'the house' was added.[415] While a patent for this invention was issued in the United States, the Canadian Patent Office rejected the application on the basis that the method claims were not directed to an *art* or a *process* within the meaning of section 2 of the *Canadian Patent Act*.[416] The Federal Court noted that the definition of *art* included *process*.[417] Thus the criteria required for patentability of an *art* under section 2 of the *Canadian Patent Act*, included a process that:

> (i) is not a disembodied idea but is a method of practical application;
> (ii) is a new and innovative method of applying skill or knowledge; and
> (iii) has a result or effect that is commercially useful.[418]

Relying on the above criteria, the Federal Court held that the subject matter of the application met the first and third provisions, as it was a practical application with commercial utility but it did not meet the second provision as the applicant's changes in the method of playing poker did not result in an innovative method of applying skill or knowledge.[419] On appeal the Federal Court of Appeal[420] upheld the board's decision and stated:

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[414] *Ibid.*

[415] *Ibid.*

[416] *Ibid.*

[417] *Ibid.*

[418] *Ibid.*

[419] *Ibid.*

[420] *Progressive Games, Inc. v. Commissioner of Patents* (2000), 9 C.P.R. (4th) 479 (F.C.A.). [*Progressive Games Appeal*]

> We do not want to be taken as deciding that more substantial changes in the existing game would have change the result.[421]

Thus relying on the above cited cases, the patent examiner often rejected a business method patent and supported the objection by stating that the claim in the application is merely a scheme, a method of doing business or a professional skill.

A potentially important case concerning the scope of patentable inventions came in front of the Canadian courts in *Commissioner of Patents v. Harvard College*.[422] Even though the case did not specifically discuss business methods, at the core of the case was the scope of the definition of 'invention' in the *Canadian Patent Act*. The Federal Court of Appeal reviewed many United States authorities and relied strongly on the United States Supreme Court's decision in *Diamond v. Chakrabarty*[423] where it was stated that the concept of invention should be broadly interpreted to include anything under the sun that is made by man.[424] However in the present case, the Supreme Court held that the Harvard Mouse was not an invention within the definition of the *Canadian Patent Act* partly on the basis that the statute used an exhaustive definition of 'invention' which signalled a clear intention of the legislature to include certain subject matter as patentable and certain subject matter to be excluded as not patentable.[425]

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[421] *Ibid. at* para 1.

[422] *Commissioner of Patents v. Harvard College* [2002] SCC 77 (S.C.C.), reversing (2000), 7 C.P.R. (4th) 1 (F.C.A.). [*Harvard College*]

[423] *Diamond v. Chakrabarty*, 447 U.S. 303 (1980 U.S.S.C.). [*Diamond*]

[424] It is noteworthy that *Chakrabarty* was one of the decisions that was relied upon by the U.S. Court in *State Street* to find whether business methods are patentable under *US Patent Act.*

[425] *Supra* note 422.

Even though the *Harvard College* was not directly related to business methods it impacted the patentability of business methods. Thus to clear the Patent Office practice for business methods, the Patent Office in 2002 distributed a first set of proposed guidelines for comments. A second set of proposed guidelines covering computer-implemented inventions and business methods was circulated in June 2003. Finally in 2005 the *MOPOP* was amended. The introduction of Chapter 12 of the 2005 version of MOPOP stated:

> The expression "business methods" refers to a broad category of subject matter which often relates to financial, marketing and other commercial activities. These methods are not automatically excluded from patentability, since there is no authority in the Patent Act, Patent Rules or in the Jurisprudence to sanction or preclude patentability based on their inclusion in this category. Patentability is established from criteria provided by the Patent Act and Rules and from Jurisprudence as for other inventions. Therefore, the fact that something is a business method does not automatically exclude it from patentability.[426]

Following these guidelines the Patent Appeal Board upheld, in three applications, patents for business methods which indicated that *Canadian Intellectual Property Organization* (CIPO) had started accepting patents for business methods.

The first case concerned a patent for a system for trading diamonds.[427] The examiner issued several subject matter objections. The examiner argued that certain choices in the setup of the claimed system were matters of professional skill and therefore the claims

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[426] Chapter 12, Subject Matter and Utility, *Manual of Patent Office Practice,* version 2005.

[427] *Re Diamonds.net LLC Patent Application No. 2,298,467*, 55 C.P.R. (4th) 328.

dealt with unpatentable subject matter.[428] The Patent Appeal Board (PAB) rejected the examiner's reasoning and stated that:

> Professional skill which falls outside the scope of patent protection involves a step in a claimed method which is carried out by a human and which relies on the intelligence and reasoning of the human to make a judgment.[429]

With respect to other objections relating to business methods, the Patent Appeal Board stated that all the claims in the application were directed to machines and machines do not have any restrictions on patentability.[430] Thus the Patent Appeal Board reversed the examiner's rejections and concluded that the system of trading diamonds is patentable under the *Canadian Patent Act*.

In the second case, the Patent Appeal Board heard an appeal on a patent application relating to the electronic trading of stocks.[431] The examiner objected that the claims lacked patentable subject matter on the basis that they related to the automation of features taught by a prior art.[432] The Patent Appeal Board rejected the examiner's objection and stated that the examiner had considered obviousness when determining whether the claims are directed to proper subject matter and that obviousness is not relevant for this determination.[433] Therefore, the Patent Appeal Board reversed the

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[428] *Ibid.*

[429] *Ibid.* at para 28.

[430] *Ibid.*

[431] *Re Belzberg Patent Application No. 2,119,921*, 60 C.P.R. (4th) 322.

[432] *Ibid.*

[433] *Ibid.*

examiner's rejection and concluded that the system of electronic trading of stocks is patentable under the *Canadian Patent Act.*[434]

The third case dealt with a patent application on an apparatus and method for group billings in cellular telephone plans.[435] The patent examiner objected that the claimed invention did not substantially modify the art of billing systems, nor did create a new or improved billing system and it further did not amount to a contribution or addition to the cumulative wisdom of billing systems.[436] The Patent Appeal Board criticized the examiners above objections and stated that:

> It is clear that the objections are focused on whether the claims, in view of the prior art, are novel or inventive, rather than whether what has been invented is *per se* patentable subject matter. This is especially clear from the passage 'do not substantially modify the art of billing systems'.[437]

The Patent Appeal Board relied upon Judge Bastarache's majority judgement in the Supreme Court of Canada's decision in *Harvard College*[438]:

> The sole question in this appeal is whether the words 'manufacture' and 'composition of matter', in the context of the Patent Act, are sufficiently broad to include higher life forms and if it is determined that higher life forms are 'manufacture(s)' or 'composition(s) of matter', then the oncomouse is an invention.[439]

The Patent Appeal Board then went on to state that:

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[434] *Ibid.*

[435] *Re Orange Personal Communications Services Ltd. Patent Application No. 2,220,378*, 62 C.P.R. (4th) 182. [*Orange*]

[436] *Ibid.*

[437] *Ibid* .at para 46.

[438] *Harvard College, supra* note 422.

[439] *Orange, supra* note 435 at para 50.

> In view of Judge Bastarache's statements, the proper assessment to be made in relation to patentable subject matter is to determine, apart from considerations of novelty, utility, and obviousness, which each require an evaluation in view of a separate test, whether the alleged invention is encompassed by at least one patentable category under section 2 of the *Patent Act*, be it art, process, machine, manufacture, or composition of matter.[440]

Accordingly, the Patent Appeal Board stated that:

> in this case, if it is determined that ... the method of generating billing data in a mobile communications network is an 'art' or a 'process', then it is patentable subject matter.[441]

Thus, from the above three cases it appeared that Canadian Intellectual Property Organization (CIPO) had adopted an increasingly favourable stance with respect to business method patents. Furthermore a recent search on the Canadian Patent Database revealed that 1017 patents have been issued till 2009 from 177 patents in 2003 within the IPC G06F 17/60[442] subgroup to date.[443] This further showed that the Canadian patent

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[440] *Ibid.* at para 51.

[441] *Ibid.*at para 52.

[442] The International Patent Classification (IPC) is a hierarchical patent classification system created under the Strasbourg Agreement (1971) and updated on a regular basis by a Committee of Experts, consisting of representatives of the Contracting States of the Agreement with observers from other organizations.
Each classification term consists of a symbol such as A01B 1/00. The first letter is the section symbol consisting of a letter from A to H. This is followed by a two digit number to give a class symbol. The final letter makes up the subclass. The subclass is then followed by a 1 to 3 digit group number, an oblique stroke and a number of at least two digits representing a main group or subgroup.
For business methods, the first letter is G as it is termed under Physics. The class symbol is 06F which stands for Electric Digital Data Processing. Finally the group number is 17/60 which stands for administrative, commercial, managerial, supervisory or forecasting purposes.
Online:<http://www.wipo.int/classifications/fulltext/new_ipc/ipc7/eg06f02.htm>. (Last visited 10.07.2010)

[443]Canadian Patent Database. Online:< http://brevets-patents.ic.gc.ca/opic-cipo/cpd/eng/search/results.html?query=%28CA%20%3CIN%3E%20INVTCOUNTRY%29%20%3CAND%3E%20%28%28G06F%2017/60%29%20%3CIN%3E%20IPC%29%20%3CAND%3E%20%28APD%3E=1869-01-01%29%20%3CAND%3E%20%28APD%3C=2005-12-31%29&start=1&num=500&type=advanced_search>. (Last visited 8.07.2010)

examiners were issuing business methods within the International Patent Classification subgroup IPC G06F 17/60.[444]

Despite the developing trend of recognizing business method patents, Canadian patent authorities reversed this trajectory in *Kaphan Patent Application 2,246,933*[445] which dealt with a business method patent.[446] The patent application dealt with a method and a system which allowed a purchaser to place an order for an item over the internet.[447] The court, relying on the U.S. and U.K. jurisprudence came to the conclusion that:

> A claimed invention which in form or in substance amounts to a business method is excluded from patentability.[448]

To uphold the above conclusion, Patent Appeal Board stated:

> Patenting business methods would involve a radical departure from the traditional patent regime, and since the patentability of such methods is a highly contentious matter, clear and unequivocal legislation is required for business methods to be patentable.[449]

In case there is no confusion regarding the earlier patents granted to business methods the Patent Appeal Board stated:

> The Board is aware that there may have been instances of patents issuing for business methods. If, however, that practice was inconsistent with a proper interpretation of the *Patent Act*, then it must be corrected. Policy and practice are not matters for stare decisis, and should be changed if found to be wrong.[450]

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[444] *Supra* note 442.

[445] *Kaphan* Patent Application 2,246,933, (2009), 75 C.P.R. (4th) 85. [*Kaphan*]

[446] *Ibid.*

[447] *Ibid.*

[448] *Ibid.* at para 140.

[449] *Ibid.* at para 180.

[450] *Ibid.*at para 182.

In the present case, the Patent Appeal Board concluded that the claimed invention was not technological in nature[451] and thus the patent application was rejected as it did not add anything to human knowledge that is technological in nature.

Following this case, Chapter 12 of MOPOP was amended in 2009 and presently 12.04.04 has been deleted and no patents are being given to business methods.[452] Chapter 12 of the 2009 version of the MOPOP presently states:

> Fields of human endeavour such as economics, commerce, accounting, recordkeeping, marketing, and law are not themselves fields of technology. While it is certainly possible for inventions of relevance to such fields to be patentable (i.e. tools for use in their practice), advances in the concepts of their practice are beyond the scope of section 2 of the *Patent Act*. This exclusion applies to many types of commercial interactions, and in some contexts can be descriptively referred to as a "business method" exclusion as was done in *Re Application No. 2,246,933* of Amazon.Com.[453]

Thus it can be concluded that the Patent Office has finally come to a conclusion that business methods *per se* are not patentable under the *Canadian Patent Act* as it stated that:

> Patenting business methods would involve a radical departure from the traditional patent regime, and since the patentability of such methods is a highly contentious matter, clear and unequivocal legislation is required for business methods to be patentable.[454]

To conclude, in Canada, in this period a lot of instability was there regarding patenting of business methods. However in *Kaphan Patent Application 2,246,933* the Canadian Patent

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[451] *Ibid.* at para 194.

[452] Chapter 12, Subject-Matter and Utility, *Manual of Patent Office Practice,* 2009 version. Online:<http://www.opic.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/eng/h_wr02208.html>. (Last visited: 8.07.2010)

[453] *Ibid* at 12.04.02.

[454] *Kaphan, supra* note 445 at 179.

Appeal Board came to the conclusion that business methods *per se* are unpatentable under the *Canadian Patent Act*. However if the business method passed the traditional criteria of patentability, it could be patentable. On the other hand it was well settled that inventions involving computer programs are patentable if they pass the traditional criteria of patentability.

To sum up, the present position of Canada is: inventions involving computer programs are patentable, computer programs *per se* and business methods *per se* are not patentable, however in certain circumstances, business methods are patentable under the *Canadian Patent Act*.

In India, as seen above, there was no protection for computer programs under the *Indian Patent Act*, even though amendments had been passed by the Indian legislature after India became a signatory to the TRIPS agreement.[455] Interestingly, a search on the patent database of the Indian Patent Office shows that patents have been issued for computer program related inventions since early 1995 in the field of image processing and data applications.[456] The most disturbing aspect of this attempt on the part of the Patent Office

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[455] India became a signatory to the TRIPS agreement in 1995 and following the TRIPS agreement it had passed the *Patents (Amendment) Act*, 1999 (No.17 of 1999) which did not state anything regarding patenting of computer programs or computer program related inventions.

[456] A few examples are Application No.: 56/DEL/1995 Dated: 1/17/1995 for An Interactive Image Analysis System; Application No.: 214/CAL/1995 Dated: 2/28/1995 for A System for Implanting an Image into a Video; Application No.: 167/DEL/1995 Dated: 2/6/1995 for Method and Apparatus for Correcting an Angle of an Optical Image for Improving the Efficiency of Fascimile Encoding of the Image; Application No.: 1142/CAL/1995 Dated: 9/21/1995 for Post-Processing Method for Use in an Image Signal Decoding System; Application No.: 576/DEL/2002 Dated: 5/22/2000 for Method and Apparatus for Recording and Reproducing Video Data, Information Storage Medium in Which Video Data is Recorded by the Same; Application No.: 125/MUM/2003 Dated: 1/30/2003 for System and Method of Mapping Patterns of Data, Optimizing Disk Read and Write, Verifying Data Integrity Across Clients and Servers of Different

is that such patent applications were issued patents even before some basic guidelines were in place.[457] It seems that probably the Patent Office followed the existing general principles of patentability for qualifying other categories of inventions. Another reason could be that the Indian Patent Office was trying to follow the TRIPS mandate, which prohibited discrimination for granting patents in the field of technology.[458] Thus it was high time in India that certain guidelines should be made so that patents are not issued to inventions which are not under the preview of the *Indian Patent Act*.

To clarify the situation regarding patenting of inventions involving computer programs, the first set of guidelines were issued by the Indian Patent Office in 2001.[459] Interestingly they were passed even before the amendment of the *Indian Patent Act*. This primia facie revealed that the Indian Patent Office was concerned about the ambiguities in practice, which would have led to patent grants by different offices, to inventions involving computer programs that were unworthy of patents. The 2001 guidelines of *Manual of Patent Practice and Procedure*, laid down six points:[460]

1. *Computer program is not patentable invention as computer program is a set of instructions for controlling a sequence of operations of a data processing system.*

Functionality Having Shared Resources; Application No.: 739/DEL/2003 Dated: 6/6/2002 Providing Contextually Sensitive Tools and Help Concent in Computer-Generated Documents.

[457] The first guidelines relating to patenting of computer related inventions was issued by the Patent Office in July 2001.

[458] Article 27.1 of the TRIPS states that patents shall be provided "for any invention, whether product or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application". [*TRIPS*]

[459] *Manual of Patent Practice and Procedure*, 2001 version, Indian Patent office.

[460] Section 1.3.8, Relating to computer programs. *Manual of Patent Practice and Procedure*, 2001 version, Indian Patent office. [*MPPP 2001*]

It closely resembles a mathematical method. It may be expressed in various forms e.g. A series of verbal statements, a flow chart, an algorithm, or other coded form and may be presented in a format suitable for direct entry into a particular computer, or may require transcription into a different format (or computer "language"). It may merely be written on paper or recorded on some machine readable medium such as magnetic tape or disc or optically scanned record, or it may be permanently recorded in a control store forming part of a computer. Thus it is evident that a program may be presented in terms of either software or firmware.[461]

2. Since the *claims may be couched in terms which tend to obscure the fact that the invention relates to a computer program, it is always essential to analyse them, in the light of what is described and of the prior art, in order to identify the contribution to the art and hence determine whether this advance resides in, or necessarily includes, technological features, or is solely intellectual in its content.* For example, if the new feature comprises a set of instructions (program), which may be formulated and presented in any one of a variety of ways, designed to control a known computer to cause it to perform desired operations, the computer being suitable for the purpose without special adoption or modification of its hardware or organization then, no matter whether claimed as "a computer arranged to operate etc" or as "a method of operating a computer etc." Such a

[461] *Ibid.* [emphasis added] It appears that the guidelines have adopted the definition of computer program, as understood in the *Copyright Act, 1957.* Section 2 (ffc) defines "computer programme" as a set of instructions, expressed in words, codes, schemes or in any other form, including a machine readable medium, capable of causing a computer to perform a particular task or achieve a particular result.

subject matter is not patentable and hence excluded from patentability. The invention here relates solely to the novel program. The claim might e.g. stipulate that the instructions were encoded in a particular way on a particular known medium but this would not affect the issue. If however the format of the program or the nature of the record medium (tape, disc etc.) necessitated some non-standard adaptation to the computer itself (this factor being integral to the invention and not an arbitrary unrelated addition) then the exclusion would not apply. Likewise, an invention which related to a particular manner of organizing the overall operation of the Central Processing Unit and the peripheral units, regardless of whether the invention were implemented by means of a program or special hardware facilities, would not be excluded.[462]

3. If the implementation of a new program requires internal modification to a computer of such a nature that it may *reasonably be regarded as a new computer* then clearly a claim to this computer is not excluded, even though at first sight the invention may seem to relate merely to a program and the purpose of modifying the computer is subsidiary to this. The modification must however be inventive itself; if a computer is modified in a manner which is the obvious way of implementing the program, then the inventive contribution will still reside solely in the program itself.[463]

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[462] *MPPP 2001, supra* note 460. [emphasis added]

[463] *Ibid.* [emphasis added]

4. As a general rule, a novel solution to a problem relating to the internal operations of a computer, although it may comprise a program or subroutine, will also *necessarily involve technological features of the computer hardware or the manner in which it operates* and thus, if appropriately claimed, may be patentable.[464]

5. A hardware implementation performing a *novel function is excluded only if that particular hardware system is known or is obvious* irrespective of the function performed.[465]

6. An invention consists of *hardware along with software or computer program in order to perform the function of the hardware*, such invention may be considered patentable.[466]

Even though many commentators showed serious concern regarding these guidelines, they became a stepping stone for the 2002 amendment of the *Indian Patent Act*.[467] However the Indian legislature took a different approach which was inconsistent with the 2001 Patent Office guidelines. The Indian legislature by way of the 2002 amendment to the *Indian Patent Act* amended Section 3, which relate to 'what are not inventions' and added a clause (k), which stated:

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[464] *Ibid.* [emphasis added]

[465] *Ibid.* [emphasis added]

[466] *Ibid.* [emphasis added]

[467] *Pai, supra* note 35.

> A mathematical or business method or a computer program *per se* or algorithms [are not inventions]. [468]

This clause gave the impression that, just like any other technology, products and processes of computer programs are also the subject matter of patent law in India, provided they satisfy the general conditions of patentability.

Further Section 2(1) (j) defines inventions as

> A new product or process involving an inventive step and capable of industrial application.[469]

Reading both the above clauses we can conclude that computer programs *per se* are not the subject matter of patentability under the *Indian Patent Act*, however in case a computer program is made a part of a process or a product and passes the test of an invention i.e. it is new, has an inventive step and capable of industrial application, then it can be patentable under the *Indian Patent Act*. Furthermore it can also be concluded that business methods can also be patentable under the *Indian Patent Act* in case they can pass the traditional test of an invention. Thus the 2002 amendment to the Indian *Patent Act* opened the doors to patenting of inventions involving computer programs and business methods in India.

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[468] The *Patents (Amendment) Act, 2002* (No.38 of 2002), An Act further to amend the Patents Act, 1970.

[469] *The Patent Act, 1970* (39 of 1970).

To further clarify the scenario regarding patenting of inventions involving computer programs, the central cabinet in December 2004 promulgated an Ordinance[470] which further amended section 3(k).[471] The Ordinance suggested the following changes:

In section 3(k) of the *Indian Patent Act*, following clauses should be substituted:[472]

> (k) A computer programme *per se* other than its technical application to industry or a combination with hardware;
>
> (ka) A mathematical method or a business method or algorithms.

The outcome of the 2004 Ordinance was that it continued to make computer programs *per se* unpatentable, but now with a more limited meaning attached to the phrase *per se*. This clause introduced two exceptions to the phrase *per se.* First exception stated that in case computer programs have a technical application to industry, they are patentable under the Act and the second exception stated that in case computer programs are combined with hardware, they are also patentable under the Act. As we know most of the computer programs work in combination with hardware and have technical application,

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[470] Article 123 of *The Constitution of India, 1950* gives power to the president of India to issue an Ordinance in case the president is satisfied that circumstances exist which render it necessary for him to take immediate action.
Article 123 states (1) If at any time, except when both Houses of Parliament are in session, the President is satisfied that circumstances exist which render it necessary for him to take immediate action, he may promulgate such Ordinances as the circumstances appear to him to require
(2) An Ordinance promulgated under this article shall have the same force and effect as an Act of Parliament, but every such Ordinance—
(a) shall be laid before both Houses of Parliament and shall cease to operate at the expiration of six weeks from the reassembly of Parliament, or, if before the expiration of that period resolutions disapproving it are passed by both Houses, upon the passing of the second of those resolutions; and
(b) may be withdrawn at any time by the President.
Explanation.—Where the Houses of Parliament are summoned to reassemble on different dates, the period of six weeks shall be reckoned from the later of those dates for the purposes of this clause.
(3) If and so far as an Ordinance under this article makes any provision which Parliament would not under this Constitution be competent to enact, it shall be void.

[471] Order No. 7 of 2004, Government of India, 2004.

[472] *Ibid.*

particularly to software industry, thus the above new clause made most types of computer programs patentable under the *Indian Patent Act*. A literal interpretation of the amendment would lead to the conclusion that any computer program is patentable in India.

The above clause met with conflicting interpretations at the Patent Office, as patent examiners started granting patents to any computer programs which were combined with hardware and demonstrated any technical application of some sort.[473] As a result of the incorrect interpretation of the above clause by the patent examiners and the vigorous opposition by the free software movements,[474] the Indian Parliament in March 2005 specifically voted it down to maintain its previous status quo.[475] Thus the 2005 Ordinance was scrapped and the Indian legislature forwarded the application of only the 2002 amendment of the *Indian Patent Act*.[476]

To further uphold the above conclusion and further clarify the situation regarding the patentability of inventions involving computer programs, the *Draft Manual of Patent,*

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[473] "According to sources, over 150 patents on 'technical effects of software' had been granted in the country even prior to the December Ordinance. These patents were granted despite the legal ambiguity that had prevailed prior to issuance of the Ordinance." *See Software Patents under Ordinance Face Reversal*, FINANCIAL EXPRESS, March 29, 2005.
Online:<http://www.financialexpress.com/fe_full_story.php?content_id=86454>. (Last visited 8.07.2010).
However these patents are being reviewed or can be challenged as violative of the equality clause (Article 14 of the Constitution of India) in case of discrepancy.

[474] Representation Made by the Free Software Foundation of India to the Government of India to Immediately Withdraw the Patents (Amendment) Ordinance, 2004.
Online:<http://www.fsf.org.in/representation/representation.html>. (Last visited 8.07.2010)

[475] Proceedings of Lok Sabha, IV LADRRIS (22/03/2005 to 07/05/2005).

[476] *Supra* note 468. The 2002 amendment stated that computer programs *per se* are not patentable however inventions involving computer programs having inventive step, novelty and causing substantial change to the hardware would be granted patents under the *Indian Patent Act.*

Practice and Procedure (MPPP) has been published by the Patent Office in 2008 and is currently under review.[477] The MPPP guidelines further confirm that computer programs *per se* are not patentable and are only protected under the *Indian Copyright Act* whereas computer program being a part of a process or a product can be patentable under the *Indian Patent Act*.[478]

As regard to India's position on patenting of business method is concerned, the *Indian Patent Act* states that business method *per se* shall be not patentable.[479] Relying on this, the patent examiner in *Application No 94/Cal/2002,*[480] which dealt with a method for issuing and redeeming of coupons/stamps, was refused a patent, as the claimed invention related to business method.[481]

A major problem that comes in patenting of business method in India is the requirement of industrial application under the *Indian Patent Act.* Thus in *Melia's Application*[482] the examiner refused to grant a patent on an application relating to a scheme for exchanging all or part of a prison sentence for corporal punishment because it lacked the requirement

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[477] Draft Manual of Patent, Practice and Procedure, version 2008, the Patent office. Online:<http://ipindia.nic.in/ipr/patent/DraftPatent_Manual_2008.pdf>. (last visited 8.07.2010)

[478] Section 4.11.1 to Section 4.11.11 of the Draft Manual of Patent, Practice and Procedure, version 2008, The Patent office deals with guidelines relating to computer program patentability. Online:<http://ipindia.nic.in/ipr/patent/DraftPatent_Manual_2008.pdf>. (Last visited 8.07.2010)

[479] Section 3(k) of the Patent act states that- a mathematical or business method or a computer program *per se* or algorithms are unpatentable.

[480] Application No 94/Cal/2002.

[481] *Ibid.*

[482] *Melia's Application* No BL O/153/92.

of industrial applicability.[483] Similar result was held in *John Lahiri Khan's Application*[484] which related to a method for effecting introduction, for the purpose of making friends or dating, by means of a device, was held not to be industrially applicable, even though it could be carried out by a commercial enterprise.[485] However it is uncertain in India whether business method patents will be granted where they solve a technical problem and an apparatus/system is used. This would only be cleared in case an application relating to business method in this area is brought in front of the patent examiner or the Patent Board releases certain guidelines regarding business method patents. Until then we can conclude that business method *per se* are not permissible under the *Indian Patent Act*.

Thus to conclude, in India during this period, the legislature passed legislation regarding patenting of inventions involving computer programs. Though this new legislation is still under scrutiny, we can conclude that inventions involving computer programs are patentable under the *Indian Patent Act*. To date, 596 patent applications relating to computer programs have been published by the Patent Office.[486] Furthermore, 70 patent applications relating to computer programs have been granted patents by the Patent Office.[487] As regard to business methods, there is still doubt regarding their patentability.

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[483] *Ibid.*

[484] *John Lahiri Khan's Application* No BL O/356/06.

[485] The application claimed a method for making friend or dating by using a ring for an introduction process. The ring could be worn by any person and could help in starting an introduction with other people, wearing the same ring.

[486] A search on the patent office website revealed that 596 patent applications relating to computer program related inventions have been published and 70 patent applications have been granted patents. To see a list of the patent applications published and granted see online: <http://ipindia.nic.in/ipirs/patentsearch.htm>. (Last visited 8.07.2010)

[487] *Ibid.*

The *Indian Patent Act* expressly states that business method *per se* are not patentable but it does not state whether business methods which solve a technical problem and have an apparatus or system, would be granted patents or not. Even the draft 2008 version of the MPPP does not expressly state the status of business methods.[488] This has been recently pointed out by Microsoft Corporation India Pvt. Limited in its comments to the draft 2008 MPPP.[489] However a recent search on the Patent Office website revealed that 9 patent applications relating to business method patents have been published by the Indian Patent Office and 1 patent application titled 'Fuel Composition Comprising Fuel and Lubrication Oil Composition' has been granted in May 2010.[490] We can conclude from the observation above that the Indian Patent Office is accepting patent applications which deal with business methods. However, with time we would have to see whether these patents granted to business methods are accepted by the Indian community or not and whether the Indian Patent Office publishes any guidelines relating to business methods or

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[488] Supra note 477.

[489] One of the comments on the draft 2008 version of Manual of Patent Practice and Procedure was by Microsoft Corporation India Pvt. Limited which stated that the Indian Patent office should look into *Bilski* case of USA.
Online:<http://ipindia.nic.in/ipr/patent/Patent_Manual_Feedback/MICROSOFT_CORPORATION_INDIA_Pvt._LTD_NEW_DELHI.pdf>. (Last visited 8.07.2010)

[490] A search on the patent office website revealed that nine patent application (Application No.901/MUM/2000 Dated.6/10/2000 for 'Multi level Business method on Internet', Application No.7178/CHENP/2008 Dated.26/12/2008 for 'Fuel Components, Fuel Composition and Methods of Making and Using Same', Application No.6813/DELNP/2007 Dated.03/09/2007 for 'Multimediator Dopamine Transport Inhibitors and Uses Related Thereto', Application No.6812/DELNP/2007 Dated.03/09/2007 for 'Dopamine Transporter Inhibitor for Use in Treatment of Movement Disorder and Other CNS Indicator', Application No. 5915/CHENP/2009 Dated. 07/10/2009 for 'System and Method for Providing Adjustable Ballast Factor', Application No. 2213/CHE/2006 Dated. 29/11/2006 for 'Additives and Lubricant Formualtion for Improved Used Oil Combustion Properties', Application No.1849/MUMNP/2008 Dated.27/08/2008 for 'A Method for Using Cell Therapy Product Facility and Franchise Market Business Method Based on Network Using the Same', Application No. 1681/MUM/2008 Dated.08/08/2008 for 'People's Green Power', Application No.1074/KOLNP/2008 Dated. 13/03/2008 for 'Contributor Reputation Based Message Board and Forums') which relates to business method patents have been published and one patent application (Patent No.240258 Application No.2213/CHE/2006 Dated 29/11/2006 for 'Fuel Composition Comprising Fuel and Lubrication Oil Composition') has been granted in May 2010. Online:<http://ipindia.nic.in/ipirs/patentsearch.htm>. (Last visited 8.07.2010)

not, until then we can conclude that business methods, while not patentable *per se*, are in certain circumstances, patentable under the *Indian Patent Act*.

To sum up, the present position of India is: invention involving computer programs are patentable, computer programs *per se* and business method *per se* are not patentable, however in certain circumstances, business methods are patentable under the *Indian Patent Act*.

3.3.2. Copyrights

In Canada, as seen above,[491] by way of the 1988 amendment to the *Canadian Copyright Act,* computer programs were explicitly granted legal protection as literary works.[492] The Ontario court in *Delrina*[493] further upheld the copyrightablilty of computer programs.[494] The court clarified the problem of application of copyright laws to computer programs and propounded the use of AFC test[495] also known as Weeding test[496] by the Canadian courts for cases relating to computer programs.[497] However *Delrina* was further appealed to the Ontario Court of Appeal in 2002, where the appellants argued that the AFC test at

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[491] Refer 3.2.2. Copyrights.

[492] *Ibid.*

[493] *Delrina, supra* note 315.

[494] *Ibid.*

[495] Abstraction-Filtration-Comparison test, *Altai*, *supra* note 324.

[496] The term "weeding test" was used in *Delrina.*

[497] *Delrina, supra* note 494.

trial was inappropriate due to the significantly different structures and development of copyright laws of Canada and United States.[498] In place of the AFC test, the appellant forwarded the use of *Ladbroke* test. The test stated:

> Did the appellants reproduce a substantial part of it? Whether a part is substantial must be decided by its quality rather than its quantity. The reproduction of a part which by itself has no originality will not normally be a substantial part of the copyright and therefore will not be protected. For that which would not attract copyright except by reason of its collocation will, when robbed of that collocation, not be a substantial part of the copyright and therefore the courts will not hold its reproduction to be an infringement. It is this, I think, which is meant by one or two judicial observations that "there is no copyright" in some unoriginal part of a whole that is copyright. They afford no justification, in my view, for holding that one starts the inquiry as to whether copyright exists by dissecting the compilation into component parts instead of starting it by regarding the compilation as a whole and seeing whether the whole has copyright. It is when one is debating whether the part reproduced is substantial that one considers the pirated portion on its own.[499]

The Court of Appeal accepted the *Ladbroke* test as the proper test to applied in Canada; however, they found that the trial judge's analysis was in effect consistent with the *Ladbroke* test.[500] Although the trial judge had adopted several general statements from *Altai*, he had compared the two works for similarities before filtration to determine which elements, if any, were entitled to copyright protection.[501] Subsequent to the above finding, the Court of Appeal specified the difference between *Altai* test and *Ladbroke* test. The Court stated:

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[498] *Delrina Corp. v. Triolet Systems Inc.* (2002) 17 C.P.R. (4th) 289 (Ont. C.A.). [*Delrina Appeal*]

[499] *Ladbroke (Football) Ltd. v. William Hill (Football) Ltd.*, [1964] 1 All E.R. 465, 1 W.L.R. 273, 108 Sol. Jo. 135 (H.L.) at para 481.[*Ladbroke*]

[500] *Delrina Appeal, supra* note 498 at para 23.

[501] Christopher Heer, "The Case Against Copyright Protection of Non-literal Elements of Computer Software" (May, 2004) Intellectual Property Journal at 11.

> In fact, it seems that they differ only in the sequence of the steps. The AFC test considers which elements are copyrightable and then compares those elements with the allegedly infringing program, whereas the Ladbroke test considers whether the defendant's work is a substantial copy of the program and then disregards copied elements that are unprotectable, in order to determine substantiality.[502]

In other words, comparison followed filtration in the AFC test but preceded filtration in the *Ladbroke* test. Moreover, reversing the order of the steps did not produce a different result. The court concluded that the proper test in Canada is the *Ladbroke* test, but the principles similar to those used in the AFC test for filtration should be used. Thus to date, *Delrina* is significantly important. In case any discrepancy comes before the court regarding copying of a computer program, the test laid down in *Delrina* is followed.

As regard to reverse engineering, the Canadian courts and the Copyright Office did not discuss much relating to this issue, however the Supreme court in *CCH Canadian Ltd. v. Law Society of Upper Canada*,[503] ruled that exceptions to copyright law, including fair dealing provisions, are an integral part of the *Canadian Copyright Act*.[504] The court stated:

> Before reviewing the scope of the fair dealing exception under the *Copyright Act*, it is important to clarify some general considerations about exceptions to copyright infringement. Procedurally, a defendant is required to prove that his or her dealing with a work has been fair; however, the fair dealing exception is perhaps more properly understood as an integral part of the *Copyright Act* than simply a defence. Any act falling within the fair dealing exception will not be an infringement of copyright. The fair dealing exception, like other exceptions in the *Copyright Act*, is a user's right. In order to maintain the proper balance between

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[502] *Delrina Appeal, supra* note 498 at para 23.

[503] *CCH Canadian Ltd. v. Law Society of Upper Canada,* [2004] S.C.J. No. 12, 236 D.L.R. (4th) 395, 317 N.R. 107, 30 C.P.R. (4th) 1, 2004 SCC 13. [*CCH*]

[504] *Ibid.*

> the rights of a copyright owner and users' interests, it must not be interpreted restrictively.[505]

Applying the fair dealing exceptions to computer programs, we can conclude that reverse engineering of computer programs in Canada could be allowed in case the act falls under the fair dealing provisions of the *Canadian Copyright Act*.[506] For example, usage of computer programs for the purpose of research or private study, does not infringe copyright.[507] Also usage of computer programs by educational institution, library, archive or museum or any person under its authority, does not infringe copyright.[508] However in case computer programs are used by educational institution, library, archive or museum or any other person under its authority, with a motive of gain, results in copyright infringement.[509]

Thus to conclude, the only major change that took place in this period is that the Canadian court started following the *Ladbroke* test and the AFC test as summarised in the *Delrina*.[510] Thus some parts of the non-literal elements of a computer program[511] such as overall design, field, record, data structures, menu screens and the structure and sequence

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[505] *CCH, supra* note 503 at 48.

[506] Section 29 to Section 29.9 of the *Copyright Act*, R.S.C. 1985, c. C-42 deals with 'fair dealing' exceptions.

[507] Section 29 of the *Copyright Act*, R.S.C. 1985, c. C-42.

[508] Section 29.3 of the *Copyright Act*, R.S.C. 1985, c. C-42.

[509] *Ibid.*

[510] *Delrina Appeal, supra* note 498.

[511] The term non-literal elements of a computer program refer to aspect of a computer program other than the written code. For example, the overall design, field, record, data structures, menu screens and the structure and sequence of execution of a computer program, are considered as non-literal elements of a computer program.

of execution of a computer program, will be protected under the *Canadian Copyright Act* but some parts of the non-literal elements of a computer program which do not pass the test laid down is *Delrina,* will not be protected. As regard to literal elements of computer programs, the *Canadian Copyright Act* had provisions to protect them.[512] Finally as far as reverse engineering of computer programs is concerned, it will be allowed and upheld in case they fall under the fair dealing provisions of the *Canadian Copyright Act.*[513]

Thus to sum up, the present position of Canada is: literal elements of computer programs are copyrightable, non-literal elements are copyrightable in case they pass the *Delrina* test, reverse engineering of computer programs is permissible, if the act falls under the fair use provisions, in the *Canadian Copyright Act.*

In India, as stated above, the legal protection to computer programs was created by the 1999 amendment to the *Indian Copyright Act.*[514] This was done in order to bring the *Indian Copyright Act* in accordance with the TRIPS agreement.[515] India being a signatory to this agreement had an obligation to abide by it and change its intellectual property laws so that the domestic laws align with the agreement.[516]

During this period, very little development took place in India regarding protection of computer programs under the *Indian Copyright Act.* The Indian courts without any

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[512] Section 2 of the *Copyright Act*, R.S.C. 1985, c. C-42.

[513] *Supra* note 506.

[514] Refer 3.2.2. Copyrights.

[515] *Ibid.*

[516] *Ibid.*

difficulty applied the provisions of the *Indian Copyright Act* to computer program cases.[517] For example, In *Microsoft Corporation v. Mr. Kiran & Another*,[518] the court held that the use of counterfeited computer programs for commercial use is not allowed under the *Indian Copyright Act* and a person selling counterfeited computer programs is liable to pay damages.[519] In this case, Microsoft instituted a case against Mr. Kiran, who had made illegal copies of Microsoft's programs and was selling it without any licence from Microsoft.[520] The court applied the provisions of the *Indian Copyright Act* and held Mr. Kiran liable and awarded punitive damages for Rs 500,000.[521] The court held:

> Copyright in a work shall be deemed to be infringed when any person without a licence from the owner of copyright does anything, the exclusive rights of which are granted to the owner of the copyright.[522]

A similar result was held in *Microsoft v. K. Mayuri and Ors*[523] where the defendants were selling the plaintiffs' programs without any licence.[524] The court held:

> Plaintiff is entitled to an award of compensatory damage, exemplary/punitive damages as well as damages on account of loss of reputation and damage to the goodwill because of sale of spurious and pirated goods by the Defendants in the name of the Plaintiff's company.[525]

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[517] *Copyright Act, 1957* (14 of 1957) as amended by *Copyright (Amendment) Act*, 1994 (38 of 1994).

[518] *Microsoft Corporation v. Mr. Kiran & Another*, C.S. (OS) 111/2003, MIPR 2007(3)214, 2007(35) PTC 748(Del). [*Kiran*]

[519] *Ibid.*

[520] *Ibid.*

[521] *Ibid.*

[522] *Ibid.*

[523] *Microsoft v. K. Mayuri and Ors*, C.S. (OS) No.1027 of 2005, MIPR 2007(3)27, 2007(35) PTC 415(Del). [*Mayuri*]

[524] *Ibid.*

[525] *Ibid.*

Thus we can conclude from the above cases that the Indian courts were applying the provisions of the *Indian Copyright Act* to computer program infringement with ease. Furthermore, in order to curb software piracy, the Indian courts were awarding exemplary damages.

To date, the Indian courts have not given their views regarding non-literal elements of computer programs. It would be interesting to see the application of the *Indian Copyright Act* by the Indian courts when a case relating to this subject matter is brought in front of them. The Indian courts may apply the test as given in *R.G. Anand,*[526] which states:

> The best test for copyright infringement, in such cases, was 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.[527]

However having no previous precedent relating to the same subject matter, the court may look at other commonwealth countries such as Canada.

As regard to reverse engineering, Section 52 of the *Indian Copyright Act* allows reverse engineering if the act falls in any one of the exceptions.[528] The section states:

> 52(aa) the making of copies or adaptation of a computer programme by the lawful possessor of a copy of such computer programme, from such copy-
>
> (i) in order to utilise the computer programme for the purposes for which it was supplied; or (ii) to make back-up copies purely as a temporary protection against loss, destruction or damage in order only to utilise the computer programme for the purpose for which it was supplied;[529]

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[526] *R G Anand v. Delux Films,* 1978 AIR 1613, 1979 SCR (1) 218, 1978 SCC (4) 118, MANU/SC/0256/1978. [*Anand*]

[527] *Ibid.*

[528] Section 52 of *Copyright Act,* 1957 (14 of 1957).

> 52(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;[530]
> 52(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;[531]
> 52(ad) the making of copies or adaptation of the computer programme from a personally legally obtained copy for non-commercial personal use;[532]

Thus the *Indian Copyright Act* permits decompilation of computer programs to make an independently created computer program with a licensed computer program, in the absence of information being ready available.[533] Further, it explicitly permits other modes of reverse engineering by permitting observation, study or test of functioning of the computer program to determine the ideas and principles underlined in the computer program.[534] Howeve r this freedom is limited by words "while performing such acts necessary for the functions for which the computer program was supplied."[535] Making of a back-up copy from a legally obtained copy for a non-commercial purpose is also permitted under the *Indian Copyright Act*.[536] Thus, these provisions expressly state the Indian legal position regarding reverse engineering.[537] However to date, no case has been

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[529] Ins. by Act 38 of 1994, sec.17 (w.e.f 10-5-1995).

[530] Ins. By Act 49 of 1999,sec. 7 (w.e.f. 15-1-2000).

[531] *Ibid.*

[532] *Ibid.*

[533] Section 52(ab) of *Copyright Act,* 1957 (14 of 1957).

[534] Section 52(ac) of *Copyright Act,* 1957 (14 of 1957).

[535] *Ibid.*

[536] Section 52(ad) of *Copyright Act,* 1957 (14 of 1957).

brought in front of the Indian courts which has called for the interpretation of these provisions.[538]

Thus to conclude, during this period, nothing changed with respect to the Indian Copyright laws. The Indian courts were applying the provisions of the *Indian Copyright Act* with ease. However possibility for future problems relating to application of Indian Copyright Act was open. The Indian courts or the legislature had not clarified their position regarding non-literal elements of computer programs. As regard to reverse engineering of computer programs, though the *Indian Copyright Act* had provisions to support reverse engineering of computer programs, application of these provisions to computer programs was not clear as no case was brought in front of the Indian Courts.

Thus to sum up, the present position of India is: literal elements of computer programs are copyrightable, non-literal elements are likely to be copyrightable if they pass the *R.G. Anand* test, reverse engineering of computer programs is likely to be permissible, if the act falls under the exception clauses, in the *Indian Copyright Act*.

3.3.3 Conclusion

Thus to conclude, after 2002, in Canada and India, computer programs were protected under both patent and copyright laws but these laws were applied differently to cases

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[537] A K Garg R C Tripathi, V B Taneja and A K Chakravarti, "Patenting of Computer Software: Status and Approach" (March 2002) 7 Journal of Intellectual Property Rights 128 at 131. [*Garg Tripathi*]

[538] *Ibid.*

relating to computer programs. Under the Canadian patent laws, computer programs *per se* are unpatentable whereas inventions involving computer programs are patentable. As regard to business methods, the Canadian Patent Office stated that business methods *per se* are unpatentable but in case they pass the traditional criteria of patentability, they are patentable under the *Canadian Patent Act*. On the other hand, under the Indian patent laws, computer programs *per se* are also unpatentable and inventions involving computer programs are also patentable. As regard to business methods, the *Indian Patent Act* states that business methods *per se* are unpatentable but in case they pass the traditional criteria of patentability, they are patentable. This approach, followed by India and Canada, for business methods, seems to be more akin to the approach followed by other countries. Countries such as United States,[539] European Union,[540] Japan,[541] United Kingdom[542] and

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[539] Recently the US Supreme court in *Re Bilski* (2008), 545 F.3d 943, 88 U.S.P.Q. 2d 1385; affirmed 2010 U.S. LEXIS 5521 stated that business methods *per se* are abstract ideas and hence not patentable under the *U.S. Patent Act*. The court further laid down the Machine-or-Transformation test, which states that a claim to a process, is to be considered for patenting only if (1) is implemented with a particular machine that is, one specifically devise is used to carry out the process in a way that is not concededly conventional and is not trivial; and (2) transforms an article from one thing or state to another.

[540] According to the Articles of the European Patent Convention (EPC), pure business methods are not deemed patentable. The European norm is to give patent protection to technical inventions, which leads to progress in overall technology. Business methods are looked upon as activities involving buying and selling, marketing, and financial schemes. Therefore, the very idea of business methods signifies an invention of a method, which, by definition is non-technical and thus non-patentable. The four-pronged test used by the EPC to determine patentability involves the following: novel, non-obvious (i.e. involves an inventive step), and capable of industrial application. Accordingly, business methods are deemed non-technical and therefore, non-patentable by EPC Article 52 (2) and Article 52 (3). However, due to broad interpretation of the EPC articles, many business methods are, in effect, granted patentability owing to their application as software on a computer which is considered technical and thus patentable. Jwalant Dholakia, "Reviewing Business Method Patents: A Strategic Asset For Companies and Inventors" (January 2007) 6:1 International Business & Economic Research Journal 49 at 56. [*Jwalant*]

[541] The Japanese Patent Office (JPO) has acknowledged the global interest in business method patents and has taken steps to formulate and revise examination standards to develop criteria required for patentability. According to JPO, the essential criteria required for business methods to be granted patentability are: application of a scientific principle, industrial application, and inventive step.
Japan Patent Office. *Policies Concerning Business Method Patents (*Tokyo: Policy Planning and Research Office, November 2000) Online: <http://www.jpo.go.jp/tetuzuki_e/t_tokkyo_e/tt1211-055.htm>. (Last visited 23.07.2010)

China[543] are protecting business methods in a process or in a similar circumstance; however business methods *per se* are unpatentable. Furthermore, if we look at the TRIPS agreement, to which Canada and India are signatories, it states that patent protection should be available for any invention, whether products or processes, in all field of technology, provided they satisfy the requirement of being new, involve an inventive step and are useful.[544] Thus one can infer that business methods, in certain circumstances, are patentable under the TRIPS agreement. Also, patent presents a far more attractive protection to business methods as patent protects the idea rather than the expression. This gives a broader protection to business methods and would be appropriate because corporations usually spend billions of dollars to build up successful methods of conducting their business, which involve enormous research and development as well as substantial investment.[545] Therefore to protect these corporations, a far more stringent and effective protection than copyright laws is needed. This becomes particularly relevant in case of e-commerce business methods, as copying of these methods are far easier on

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[542] In UK, after the *Aerotel Ltd v Telco Holdings Ltd* [2006] EWCA Civ 1371, the UK Court of Appeal laid down test for patentability of business methods. The test comprised of the following steps (a) properly construe the claim, (b) identify the actual contribution, (c) ask whether it falls solely within the excluded subject matter, (d) check whether the actual or alleged contribution is actually technical in nature. Online:< http://www.ipo.gov.uk/pro-types/pro-patent/p-law/p-pn/p-pn-subjectmatter.htm>. (Last visited 22.07.2010)

[543]Chinese patent laws has determined the following criteria for assessing patentability for business method patents:
1. When the subject matter of the application only involves business method as such (pure business method) and consequently there is no technical character, the subject matter belongs to rules and methods for mental activities. Therefore no patent shall be granted.
2. When the subject matter involves the business methods executed through the adoption of technologies such as network or computer, it is required to determine whether the subject matter "adopts technical means, resolves a technical problem and creates a technical effect" (If the answer is yes, business method patents can be granted). *Jwalant, supra* note 540.

[544] *TRIPS, supra* note 458.

[545] Abhimanyu Ghosh, "Business Method Patents: The Road Ahead" (May 2006) 11 Journal of Intellectual Property Rights 175 at 179.

the internet as compared to conventional business methods.[546] Thus in order for Canadian and the Indian computer program developers to protect their business methods and remain in competition with other countries, the legislature and the Patent Office should continue protecting business methods in certain circumstances, under the patent laws.

Comparing the copyright laws of both the jurisdictions, we can see that literal elements of a computer program are protected under the Copyright Acts of Canada and India. As regard to non-literal elements in a computer program, Canada on one hand has adjudged upon this scenario and has created the *Delrina* test. On the other hand, India has not faced the problem relating to protection of non-literal elements in a computer program to date, however it can be predicted that it might apply the *R.G. Anand* test but this test being too general in nature, might not be useful. Thus the Indian legislature or the Copyright Office should clarify their position regarding protection of non-literal elements in a computer program. Finally, as regard to reverse engineering, both the countries have, till date not adjudged or upheld whether reverse engineering is permissible under their copyright laws. However it can be inferred from the provisions laid down in copyrights laws of Canada and India that reverse engineering would be allowed in both the jurisdictions in case the act falls under the exceptions to copyrightability. These provisions are available to other literary works; however till date, it is not clear whether these provisions would be available for computer programs. Thus the legislature and the Copyright Office of both the countries should clear there position regarding reverse engineering of computer programs.

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[546] *Ibid.*

3.4. Analysis of the Development of Protection for Computer Programs

After analysing the development of protection for computer programs under patent and copyright laws in Canada and India, we can conclude that both the countries took divergent approaches to protect their software industry. Canada, being the first among the two, started protecting its software industry under patent laws whereas India started protecting its computer programs industry under copyright laws. With time, Canada brought computer programs under the purview of its copyrights laws and India brought computer programs under the purview of its patent laws. Furthermore, we can see that the protection of computer programs developed in Canada parallel to the computer program technology. Thus the legal jurisprudence in Canada was a result of case laws which came in front of the Canadian courts. On the other hand, in India, legal protection to computer programs was only given after India became a signatory to the TRIPS agreement. Thus the legal protection of computer programs in India is based upon a single agreement, which is based upon the global consensus for protecting computer programs. However, in spite of the divergent approaches taken up by Canada and India to arrive at appropriate protection for computer program, both countries protect their computer programs under patents and copyrights.

The present position of Canada and India regarding legal protection for computer programs is summed up below:

	COPYRIGHT		PATENT	
	Canadian Copyright Act	Indian Copyright Act	Canadian Patent Act	Indian Patent Act
Literal Elements of a Computer Program	X	X		
Non-Literal Elements of a Computer Program	X	X		
Reverse Engineering	X	X		
Inventions Involving Computer Programs			X	X
Business Methods *in certain circumstances*			X	X

Table 1: Present Legal Position for Protection of Computer Programs

Thus to conclude, computer programs in Canada and India are protected under both patent and copyright laws. The literal elements of computer programs and non-literal elements of a computer program are protected under the copyright laws. Furthermore, both the jurisdictions have provisions for reverse engineering of computer programs.

Inventions involving computer programs are protected under the patent laws of both the jurisdictions. As regard to business methods, Canada and India patent laws do not permit the patenting of business methods *per se;* however in certain circumstances, business methods are patentable under patent laws of Canada and India.

Chapter Four: Patent vs. Copyright—The Actual Showdown

Following the overview of the development of protection for computer programs under patents and copyrights in Canada and India, this chapter will try to weigh the advantages and disadvantages of patents and copyrights to both the computer program developers and consumers. These advantages and disadvantages can vary from one country to another, thus this chapter is designed to assess on a broader level whether patents or copyright is appropriate for the consumers and the computer program developers.[547]

4.1 Patents

Patent laws grant the holder of a patent the exclusive right to make, use or sell the invention covered by the patent, for a period of twenty years,[548] from the date of filing the application for the patent.[549] It is granted by the Patent Office to an invention only if it is new, non-obvious and possesses utility (and, in case a patent is applied in India, the inventions should also possess industrial application).[550] They provide a more effective way than copyright, trade secret and criminal law, when it comes to protecting the idea or

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[547] The analysis in this chapter takes into account economic conditions that influence the market. However the analysis does not undertake a full economic analysis. It only relies on certain economic conditions such as monopolies, pricing of computer programs, rate of innovations etc. These points are only for illustrative purposes. Thus these points need to be fully exploited in future research showing exactly how economics influence the software market.

[548] In Canada and India, a patent is granted for 20 years from the date of filing the application. Refer 1.5.3. Patents.

[549] *Takach, supra* note 108 at 93.

[550] Under the *Canadian Patent Act*, there are only three prerequisites i.e. the product should be new, non-obvious and possess utility. However the *Indian Patent Act* has another pre-requisite apart from the above stated pre-requisite, which is industrial application.

functionality of software.[551] Furthermore, the boundary of the patented computer program is known because of the claims laid down in the patent.[552] Patents also do not allow protection for independently created similar works.[553] As a result of the high level of protection patents offer, the demand for patent protection rights for computer programs has increased globally.[554] However, in the global debate as to whether computer programs patents are useful or harmful for the growth of the software industry, different views have emerged. Many organizations such as the Free Software Foundation[555] and the League of Programming Freedom[556] have raised concern regarding the patenting of computer programs. According to the League of Programming Freedom:

> Software patents threaten to devastate the computer industry. Patents granted in the past decade are being used to attack companies for selling programs that they have independently developed. Soon new companies will be barred from the software arena, as most major programs will require licenses for dozens of patents, and this will make them infeasible. This problem has only one solution: software patents must be eliminated.[557]

Furthermore Pamela Samuelson states:

> The computer software industry has grown significantly without patent protection and that many in the industry express opposition to or doubt about patent protection for software innovations suggests that we should be wary of a policy that would grant patents to any computer program related innovations. Historical

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[551] *Suman, supra* note 49 at 518.

[552] *Ibid.*

[553] *Ibid.*

[554] *Ibid.*

[555] The Free Software Foundation (FSF) is a nonprofit organization with a worldwide mission to promote computer user freedom and to defend the rights of all free software users.

[556] The League of Programming Freedom is an organization consisting primary of programmers, whose purpose is to bring back the freedom to write software.

[557] *League of Programming Freedom, supra* note 45 at 299.

> limitations on the scope of the patents, in various countries, and concerns raised by prominent people in the computer science and software development communities raise serious doubts about the use of patents as a form of intellectual property protection for software innovations.[558]

The above passages summarize the concern regarding the ill effects of patenting computer programs. The analysis below, weighs these ill effects of patenting against the benefits of patenting.

4.1.1. Disadvantages of Patenting of Computer Programs

4.1.1.1. *To the Computer Program Developer*

A computer program developer is a person or organization concerned with the formulation of computer algorithms and codes that form a computer program. The formulated computer program is the person's or the organization's creation and idea. To protect this creation and idea the patent laws grant the exclusive right to use or sell the invention to the patent holder. In case of infringement to this exclusive right, the patent holder can file a suit against the person who has infringed his rights.

Even though patent laws have many advantages for the computer program developer there are some reasons which tend to be disadvantageous to the computer program developers. Some of the reasons have been summarized here below:

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[558] *Samuelson, supra* note 33 at 1026.

A. Difficulty in Searching for Prior Art

The literature of software technology is unbelievably large. It not only contains academic journals, conference proceedings, and user manuals but also contains published source code, and accounts in magazines. This situation becomes even more complex in case of patented combination of algorithms and techniques.

Furthermore, the patent application only contains a design or a diagram of the invention. It does not expressly state the algorithm or code to be patented. This makes the prior art search an impossible task. To add to the difficulty, the Patent Office does not have a workable scheme for classifying software patents as it has for other fields of technology.[559] Patents are most frequently classified by end use result, such as 'converting iron to steel' but many patents cover algorithms whose use in a program is entirely independent of the purpose of the program.[560] Furthermore, computer programs are not considered patentable *per se* under the patent laws, thus there is no consistent scheme to classify them. Computer programs are only given patents when they are linked to a process or an apparatus or when they are hidden in some other inventions. To search for these process and apparatus and to find out the hidden computer program, is a difficult and time consuming job for the patent examiner and the computer program developer. The International Patent Classification also does not have a classification

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[559] *League of Programming Freedom, supra* note 45 at 306.

[560] *Ibid.*

number such as section symbol, subgroup, class, class number for computer programs as it has for other technologies.[561]

Even if developers could afford patent searches, another problem that would arise is that there are no reliable methods for avoiding the use of patented techniques. This is because patent searches do not reveal pending patent application, which are kept confidential by the Patent Office.[562] Since it takes several years on an average for a software patent to be granted,[563] a serious problem would arise, similar to other fields of technologies; a developer could begin designing a large program, only to find out later that some parts of the program had already been patented by another developer. For example, the widely used data compressing program "Compress" was made following an algorithm obtained from the IEEE Computer Journal.[564] This algorithm is also used in several popular programs for computers such as PKZIP.[565] However the computer program developer

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[561] *Supra* note 442. The International Patent Classification has eight section symbols. They are (A) Human Necessities, (B) Performing Operations, Transporting, (C) Chemistry, Metallurgy, (D) Textiles, Paper, (E) Fixed Constructions, (F) Mechanical Engineering, Lighting, Heating, Weapons, (G) Physics, (H) Electricity. Computer programs can be classified under any of the above section symbols if they are attached to an apparatus or a part of a process. Computer programs do not have a separate section symbol for themselves.

[562] *Ibid.*

[563] It takes an average of 32 months for a software patent to be approved and published. See Brain Kahin, "The Software Patent Crisis" (1990) Technology Review 50 at 55. The fastest patent approved came within a year and the longest patent approval took five to six years. See Bob De Matteis, *From Patents to Profit: Secret & Strategies for the successful Inventor*, (New York: Square one Publishers, 2005). It took 3.5 years for the US patent office to grant patent for 'news feed' for the social website Facebook. Online: < http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&p=1&u=%2Fnetahtml%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&co1=AND&d=PTXT&s1=facebook&s2=zuckerberg&OS=facebook+AND+zuckerberg&RS=facebook+AND+zuckerberg>. (Last visited 10.07.2010).

[564] Brett Glass, "Patently Unfair?" (1990) Info World 52 at 56.

[565] *Ibid.*

communities were surprised to learn later that a patent had been issued to one of the authors of the article and thus the author was demanding royalties for using the algorithm.[566] Thus, for reasons stated above, it is difficult to search for prior art in the field of software technology.

B. Patenting May Discourage Small and Medium Enterprises

Patenting of computer programs may discourage small and medium enterprises as they do not have a large defensive patent portfolio.[567] The patenting system prohibits them from applying new ideas on the innovations already patented as it may land them in lawsuits for infringement of the patented computer programs. Patent litigation is extremely expensive, often involving millions of dollars in attorneys' fees and other costs.[568] Thus making changes to the already patented computer program may result in expensive lawsuits which would be a huge burden on small and medium enterprises.

While making a computer program, software developers may find it difficult to find algorithms or combination of algorithms which are not already patented. Sometimes they may not incorporate these algorithms due to the fear of infringements, or complexity of

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[566] *Ibid.*

[567] Software companies like IBM and Microsoft have a large defensive patent portfolio. IBM alone has been granted 38,000 patents. In 2007 alone IBM received 3,125 patents. It has a centralized licensing system which is run by multinational staff members. On the other hand Microsoft currently has 8,500 issued U.S. patents and 15,000 pending patents. It also has an in house centralized licensing system. Taking care of so many patents and issuing licenses requires a large patent portfolio. See Microsoft Patent Portfolio Tops IT Industry Scorecards, (Jan 28, 2008)
Online : < http://www.microsoft.com/presspass/features/2008/jan08/01-28patents.mspx> and IBM Patents portfolio < http://www.ibm.com/ibm/licensing/patents/portfolio.shtml>. (Last visited 8.07.2010)

[568] Adam B. Jaffe and Josh Lerner, *Innovation and Its Discontents* (New York: Princeton University Press, 2004) at 4.

obtaining licenses from the patent owners. Even if software developers could obtain a license from the patent owners, they would have to pay royalties to the patent owner. In case software developers invent a new computer program and apply for a patent, the provisions of the license would state that the software developer would have to acknowledge the use of the earlier patented computer program and give part of the royalty, earned by the software developer, to the patent owner, whose patent has been used. The provisions of the license would also state that the licensor would have a free use of the new computer program without any royalty and interference by the patent owner.

Another drawback for patenting computer programs is that small and medium enterprises have to pay license fee to prior patent holders. These license fees in some cases could be beyond the resources of the small and medium enterprises. However, this case does not hold true for large enterprises. Large enterprises such as Microsoft, IBM have enough resources to buy license from small and medium enterprises. Thus, for the reasons stated above, patenting of computer programs may discourage small and medium enterprises.

C. Difficulty in Making New Computer Programs

Software is a very complex product because it is free from many real world constrains, which limits the complexity in most of the industrial products.[569] For example, in case of sophisticated consumer goods such as video camera, there may be at the most 1000 components. It may involve components covered by a few patents which could be found

[569] *Suman, supra* note 49 at 519.

out. On the other hand, computer programs comprise of anywhere between 1 million to 10 million lines of codes, out of which separating the patented codes from the unpatented codes is a difficult job.[570] Thus there would be an explosion of potential patent coverage, which will make it difficult to know with certainty what is patented and what is not patented.

D. Problem with the Patenting System[571]

There are certain flaws in the patenting system as a whole. These flaws not only relate to conventional technologies but also relate to new fields of technologies such as software technology. These flaws can be summarized as below:

First, the present patenting system is only relevant for granting patents to conventional inventions. For example, inventions such as, electric hammers and telephones which covers only a particular method to build the invention. On the other hand, a computer program includes various methods to build the computer program and contains many features. Granting patents to computer programs would bar other developers from using all the methods and features, which are patented. Furthermore, once a method or feature is patented, it may not be used in a system without the permission of the patent holder, even if it is implemented in a different way.[572] The computer program developer would

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[570] *Ibid.*

[571] The disadvantages stated in this point relates to the patenting system as a whole. These advantages will hold true not only for software technology but also for other technologies. However, the illustrations stated in this point are made keeping in mind computer programs.

[572] *League of Programming Freedom, supra* note 45 at 299.

find it difficult to build a new computer program without infringing the rights of the patented computer programs. Even if the computer program developer builds a new computer program after taking a license from the prior patent holders, the new computer program would be expensive for the public to buy as it would contain the cost of the license fee that the computer program developer had to pay. It will result in less benefit to the public as it will be expensive for the general public to buy some of these computer programs. Thus, the above scenario will be against the objective behind the establishment of the patent system as the general public will not benefit from the revelation of the invention.

Second, the time consuming application process required for obtaining a patent is another disadvantage for patenting computer programs as it does not suit the realities of software development.[573] It can take more than a year for the Patent Office to grant protection.[574] In a field as technologically advanced and fast-paced as computer program development, this is too long. Software can be considered obsolete after as little as six months.[575] The nature of computer program code necessitates that better innovations are developed at all the time. To wait over a year to receive a software patent is like having no effective protection at all. Furthermore, the time lapse issue is directly related to the qualifications of the Patent Agents. Software is a new field for intellectual property. It is constantly changing. New languages are being introduced, new purposes are being discovered and

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[573] *Karjala, supra* note 27 at 45.

[574] *Durell, supra* note 28 at 254.

[575] *Ibid.*

new methods of coding are being constantly arrived at. Thus the Patent Agent must be knowledgeable if they are to be of any use as adjudicators of a claim.[576] It is impossible to understand the merits of software if you have never used it or if you do not understand how it is created.[577] Educated Agents would be able to process a claim quickly because they would already understand the issues surrounding program development.[578] This would help ease the problem caused by the lag between application and answer. Moreover, it would help remove the inconsistency inherent in patent application evaluation.

Third, the cost of patent application is an issue for smaller companies and individual inventors. The computer software market is flexible. Programmers do not need to have offices; they do not need to wear suits and ties. Many consult independently; some of these programmers are very young. Although big software companies, such as Corel and Microsoft, are very sophisticated, many individual developers or developer companies are not.[579] A patent has to be processed and granted by the Patent Office. The patent application process is complex, usually requiring the services of a registered Patent Agent to draft and prosecute the application, adding to the cost of both the inventor as well as on government of the country.[580] This process is also time consuming as it requires a 'prior

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[576] *Karjala, supra* note 27 at 45.

[577] *Durell, supra* note 28 at 254.

[578] *Ibid.*

[579] Microsoft Patent Portfolio Tops IT Industry Scorecards, (Jan 28, 2008) Online : < http://www.microsoft.com/presspass/features/2008/jan08/01-28patents.mspx>. (Last visited: 8.07.2010)

[580] *Garg Tripathi supra* note 537 at 131.

art' search on a global platform.[581] Thus, high patent application cost results in an adverse effect on smaller companies and individual inventors.

Fourthly, software products evolve very fast. Every day new computer hardware or techniques are formulated. This rapid qualitative change in the nature of software is likely to continue for years to come. On the other hand, a patent is assigned to a product for twenty years. Thus the present patent system is alright for conventional industries, which typically produce a new generation of products every ten to twenty years on an average.[582] This is not the case in software industry where the rate of product generational change is higher than conventional industries.[583] Software can be considered obsolete after as little as six months.[584] Thus the existence of the present patent system on software, for such a long period, will make it difficult to develop new products, which in turn would retard the rate of growth of software industry.[585]

Lastly, at present, patent applications are being filed with the help of lawyers who are skilled in patent subject matter.[586] They use legal language which is difficult for the

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[581] *Ibid.*

[582] *Suman, supra* note 49 at 518.

[583] *Ibid.*

[584] *Durell, supra* note 28 at 254.

[585] Gordon Irlam and Ross William, "Software Patents: An Industry at Risk", (1994). Online < http://progfree.org/Patents/industry-at-risk.html> (Last visited 25.06.2010). Also see: Stuart Macdonald, "when means become ends: considering the impact of patent strategy on innovation", (March 2004) 16:1 Information Economics and Policy 135-158.

[586] *League of Programming Freedom, supra* note 45 at 305.

computer program developer to understand.[587] Thus cases may arise where the computer program developer would think that the algorithm or the code is not protected under patent but actually they had been patented. This would result in an unnecessary law suit. On the other hand, computer program developers who would want to protect their computer programs would take the help of lawyers, who are skilled in the patent subject.[588] This would result in developers at the mercy of the lawyers as they would require the help of a lawyer to understand a patent application and to file a patent application. Thus for the reasons stated above, the patent system is not appropriate for technologies such as computer programs.

4.1.1.2. *To the Consumer*

Consumers are the backbone of the computer industry. If there are no buyers for the computer programs then there would be no need for software development. However there are certain disadvantages of patenting of computer programs to the consumer. Some of the reasons are summarized below:

A. Monopoly for Developers[589]

Monopoly is the sole right to buy, sell, make, work or use a thing, but the definition of monopoly is not complete until we add the factor that monopoly also seeks to restrain

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[587] *Ibid.*

[588] *Ibid.*

[589] The analysis in this part takes into account 'monopoly' only for illustrative purposes. It only relies on the condition that monopoly increases or decreases the price of the product, which puts the consumer at the mercy of the computer program developer. These points are only to illustrate the ill effects of the patenting system. Thus these points need to be fully exploited in future research.

third parties from a freedom or liberty which they had before.[590] Such a market can only exist if there are barriers to entry. [591] Patent laws provide a legally enforceable barrier.[592] Sellers with monopoly positions generally follow their self interest and increase or decrease the price of their products.[593] The seller being the sole owner, has the power to increase or decrease the price of the product as he or she, has the sole control over the market conditions relating to that product. This holds true for software technology as well. For example, the Microsoft Corporation had a monopoly in the DOS market till mid 1990s as the MS-DOS program was considered the de facto software standard for the Intel x86 class of microprocessors.[594] Microsoft being the sole owner had the power to increase or decrease the cost of this product.

Edmund Kitch has identified two forms of competitive pressure on a patent holder which lessens the possibility of monopoly.[595] First, many patents have numerous close substitutes.[596] For example a patented telephone might simply be an alternative to numerous other types of telephones.[597] Second, as the end of the patent term draws near,

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[590] Bankole Sadipo, *Piracy and Counterfeiting: Gatt and Developing Countries*, 1st ed. (London: Klwer International Publications, 1977) at 88.

[591] *Randall, supra* note 34 at 1127.

[592] *Ibid.*

[593] *Ibid.*

[594] Max D. Wheeler, "Monopoly in the computer software industry: higher prices, inferior products and retarded innovations" (1997) 66 Antitrust Law and Economic Review.

[595] Edmund Kitch, "Monopolies or Property Rights?" (1986) 8 Research in Law and Economics 22 at 31.

[596] *Ibid.* at 33.

[597] *Ibid.*

the patent holder will have an incentive to increase output and lower the price in order to obtain a share of the expanded, post-patent market.[598]

However comparing these factors with computer programs, it can be predicted that there will be negligible pro-competitive effect.[599] First, pressure from competitors offering substitutes seem slight. Since a patent on a computer program will in effect cover the idea behind the program, no other method can be used to accomplish the same idea.[600] Even if other methods are found out to accomplish the same idea, there will be less competition between the two methods. For example, if we look at the computer operating system market there are only two prominent developers; Microsoft and Apple. Both of them being the prominent operating system developers are charging a high price for their products. Thus it seems unlikely that more close substitute will be available for competition to increase, which eventually would help decrease the price of the products.[601] Second, the possibility of post-term competitive pressure on patent holder is slight as the actual life of a computer program is much less than the actual life of the patent term.[602] To sum up, the two competitive factors identified by Edmund Kitch would only have limited impact on the patent holder. [603] Thus for the reasons stated above,

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[598] *Ibid.*

[599] *Randall, supra* note 34 at 1128.

[600] *Ibid.*

[601] *Ibid.*

[602]Rodau, "Protecting Computer Software: After Apple Computer, Inc v. Franklin Computer Corp., Does Copyright Provide the Best Protection?" (1984) 57 Temple University Law Quarterly 511 at 532. The author quoted: "In the high technology are of computers...the economic life of an innovation may be only a few years".

[603] *Supra* note 591 to 593.

because of the monopoly, the computer program developer will have the opportunity to charge arbitrary prices for their products.

B. Slow Advancement of Technology[604]

Granting patents to computer program would result in slow advancement of software technology. As the patent holder would be the only one having rights to further advance or change the computer program, the consumer would be at the mercy of the developer.[605] Furthermore, as a result of software patents, many areas of software development would simply become out of bounds. A good example is the field of text data compression.[606] There are now so many patents in this field that it is virtually impossible to create a data compression algorithm that does not infringe at least one of the patents.[607] For example-the LZW compression algorithm was written in 1984 and many program developers started using it.[608] But in 1985 the U.S. Patent Office issued a patent on this algorithm barring other program developers from using this algorithm even if they had already incorporated it into their programs.[609]

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[604] *Supra* note 589.

[605] *Suman, supra* note 49 at 520.

[606]Richard M Stallman, *The Danger of Software Patents* (Boston: GNU Press,Free Software Foundation, 1997) at 97.

[607] *Ibid.*

[608] *Ibid.*

[609] *Ibid.*

Furthermore, the monopoly conferred by the patent would stifle further improvements in the underlying idea.[610] Any first new and non-obvious program would be patentable without regard to how well written it was or how efficiently it ran.[611] As the patent monopoly limits competitive pressures, the patent holder would have less incentive to improve the software.[612] Thus, progress in the software industry would be stifled, not improved, by computer program patents.[613] On the other hand, even if it is possible that a patent free algorithm exists, it would be difficult to establish this fact due to the problem of 'prior art' search. And still in the end, any of the relevant patent holders would be able to launch a lawsuit.[614] For the small companies, even tiptoeing through the mine field is not good enough. The mines do not need to go off to be damaging. Thus, software patents are likely to jam up the development of all future new areas of software technology.

4.1.2. Advantages of Patenting of Computer Programs

Even though patenting of computer programs has certain disadvantages, there are some advantages for patenting of computer programs.

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[610] *Randall, supra* note 34 at 1128.

[611] Spakovsky & Graffeo Spakovsky, "The Limited Patenting of Computer Programs: A Proposed Statutory Approach" (1985) 16 Columbia Law Review 23 at 45.

[612] *Randall, supra* note 34 at 1128.

[613] *Ibid.*

[614] *League of Programming Freedom, supra* note 45 at 299.

4.1.2.1. To the Computer Program Developer

A. Reward to the Developer

Patents in some cases, bar other user to make innovations on the same idea.[615] Thus in case another computer program developer would want to use the innovation would have to take a license from the patent owner.[616] This licence would be given on the acceptance that certain amount of money as royalty would be given to the patent owner. Thus patent rights allow the developer to obtain profits because of his legal right to exclusive sale and use.[617]

Furthermore, the patent system allows companies to recover their research and development cost during the period of exclusive rights so that they can further invest in research. For example: Looking at IBM's Annual Report of 2001, we can see the company's Intellectual Property Portfolio generated US$1.5 billion in licensing royalties.[618] The company was awarded a record 3,411 patents in the year 2001.[619] Thus granting of patents to computer programs rewards the developers and helps them to incur profits, which the developers can further use for research and development, in the computer program field.

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[615] *Suman, supra* note 49 at 518. In some cases, patents bar other user to make innovations on the same idea. For example, in some cases the patent owner might refuse to grant a license to any other computer program developer. This would bar the other computer program developers, from using the same idea, for the period of the patent.

[616] Chapter XVI of the Indian *Patent Act, 1970*, 39 of 1970 and Section 44 of the Canadian *Patent Act, 1985*, R.S.C.1985, c.P-4.

[617] *Randall, supra* note 34 at 1124.

[618] D Q Team, "Industry Analysis: Intellectual Property" (2002) 20 Dataquest at 193.

[619] *Ibid.*

B. Encourages New Technology

Patenting of computer programs provides two private incentives to the patent owner: an incentive to invent and an incentive to invest.[620] The interaction of these two incentives can be demonstrated by the careers of Thomas Edison, Alfred Nobel, Chester Carlson, Edwin Land, Bill Gates, Steve Jobs and other 19th and 20th century inventor-entrepreneurs who built great commercial enterprises on the success of their patented inventions.[621] It is a continuous, self-feeding cycle: royalties from patented inventions pay for further research and the development of newer, better inventions and technologies, which are then patented and commercialized, earning more royalties which pay for more research and development.[622] This rationale for patenting has been laid down in domestic laws of most of the countries.[623]

Furthermore a patent is a sort of shelter from the forces of market competition for the individual possessing the patent.[624] The shelter is limited to the precise terms of the claims of the patent, but it is sturdy and durable for many years.[625] The premise of the

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[620] Graeme B. Dinwoddie et al., *International and Comparative Patent Law* (Ohio: LexisNexis, 2002) at 50.

[621] *Ibid.*

[622] *Lula, supra* note 51 at 158.

[623] Article I, Section 8, Clause 8 of the U.S. *Constitution* clearly states the rationale behind the patent system. It states that the patenting system has been laid down "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." The Indian *Patent Act* also has a similar rationale behind the patenting system. The statement of object and reasons, presiding the *Patent Act* states that, new inventions in the field of art, process, method or manner of manufacture, machinery, apparatuses and other substances, produced by manufacturers are on an increase. To protect these inventions from copying or adopting the method, the Indian *Patent Act* has been enacted.

[624] *Idris, supra* note 53 at 9.

[625] *Ibid.*

patent is that this shelter and the resulting competitive advantage encourage invention because inventors know that they can reap a financial reward from their ingenuity.[626]

The patent system also promotes technological and business competition because patent holders must disclose the details of their inventions in exchange for the specified period during which they have exclusive rights over their exploitation.[627] As a result, both the patent holders and their competitors race to improve those inventions and to use the technology to create new ones.[628]

Encouraging the introduction of patents to computer programs also provides a public incentive.[629] Patents stimulate a nation's economic growth in four main ways.[630] First, they facilitate technology transfer and investment.[631] Second, they encourage and facilitate research and development at universities and research centres.[632] Third, they lead to new technologies and businesses.[633] Fourth, they generate revenue for businesses

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[626] *Ibid.*

[627] *Ibid.*

[628] *Ibid.*

[629] *Idris, supra* note 53 at 10.

[630] *Ibid.*

[631] *Ibid.*

[632] *Ibid.*

[633] *Ibid.*

that accumulate and use patents in licensing, joint ventures, and other revenue-generating transactions.[634]

Thus to sum up, a patent rewards the investment of time and money put in by the researcher in his endeavour and further stimulates research by encouraging competition as rivals try to invent alternatives to the patented inventions.[635]

4.1.2.2. *To the Consumer*

A. Public Disclosure and New Innovative Products

The patent laws ensure public disclosure of new technological information.[636] Public disclosure is perhaps the most significant aspect of creation and invention, for what good is an idea if not known or realized. [637] An idea in the mind of one person is well and good, but an idea spread among the masses inarguably has greater influence and strength.[638] When a patent is granted to the patent owner, he or she discloses his or her creation to the world. This results in the increase of technical knowledge among the masses and further discourages secrecy.[639] The disclosure goal of the patent system

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[634] *Ibid.*

[635] *Suman, supra* note 49 at 518.

[636] *Lula, supra* note 51 at 158.

[637] *Ibid.*

[638] *Ibid.*

[639] Jeffery S. Goodman, "The Policy Implication of Granting Patent Protection to Computer Software: An Economic Analysis" (1984) 37 Vanderbilt Law Review 151 at 157.

applies best to inventions which cannot be appropriated by mere observation.[640] In the computer software context, these inventions are in fact innovative algorithms, which usually cannot be discerned from observing the software.[641]

Furthermore, new ideas help in formulation of new products.[642] By generating new products, the consumer on the other end gets a variety of products to choose from. Not only this helps in economic growth of a country, but also results in the advancement of software technology.[643]

4.2. Copyrights

Copyright protects the written expression of an idea presented in the form of literary works.[644] As software is a collection of written computer programs, representing an expression of an underlying idea, the copyright protection was extended to computer programs.[645] Under copyright law, the original software is automatically covered by copyright as soon as it is written and saved.[646] The copyright only protects the expression

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[640] *Randall, supra* note 34 at 1124.

[641] *Ibid.*

[642] *Supra* note 620 to 635 and note 636 to 641.

[643] *Supra* note 630 to 634.

[644] *Suman, supra* note 49 at 517.

[645] *Ibid.*

[646] *Ibid.*

and not the underlying idea of the software.[647] It protects against unauthorized copying of computer program source code[648] and object code.[649] It is also cheaper and easier to obtain than a patent.[650] The disadvantage of copyright is that it does not protect the functionality of the software, which is of key importance.[651] Software being dynamic in nature has functional aspects, which are different from other art and literary works.[652] Experienced programmers can easily circumvent the copyright protection of the software by copying its functionality but not directly copying the codes.[653] Let us examine the advantages and disadvantages of granting copyright protection to computer program.

4.2.1 Disadvantages of Copyright Protection to Computer Programs

4.2.1.1. *To the Computer Program Developer*

A. Protects Expression not Idea resulting in Similar Products

One of the major disadvantages of copyright protection is that copyright does not protect the idea underlying a computer program.[654] The protection only extends to the

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[647] V K Gupta, "Managing Software Protection" (2002) Journal of Intellectual Property Rights 260 at 277. [*Gupta*]

[648] Source Code, human readable form of software.

[649] Object Code, machine readable form of software.

[650] *Ibid.*

[651] Avinash Kumar, "In the Matter of According Legal Protection to Intellectual Property Rights in Software: Options for Policy", (2000) Directorate of Extramural Research and Intellectual Property Rights, Defence Research and Development Organization at 4-43.

[652] *Ibid.*

[653] *Ibid.*

[654] Sherman et. al., "Computer software Protection Law" at 201.6 as stated in Brian W. Smith, *E-commerce: Financial Products and Services*, (New York: Law Journal Press, 2001) at 5-19.

programmer's expression of the underlying idea.[655] Thus a copyright does not exclude independent creation of similar software invention.[656]

For example the Windows Internet Explorer,[657] Apple Safari[658] and the Mozilla Firefox [659] all of these three computer programs have the same purpose or idea of "web browsing" but have been constructed differently. Thus protecting computer programs by way of copyright law only protects the expression of computer programs. They do not protect the idea behind the computer program. This results in similar computer programs having the same idea.

B. No Monopoly

A corollary to the above stated disadvantage, granting copyrights to computer programs does not grant monopoly to the copyright holder. As other computer program developers have the right to research under copyright laws, it results in similar computer programs with the same idea behind them.[660] Similar computer programs results in no monopoly and encourage competition among the computer program developers. For example, if we look at the computer antivirus market, there are many companies such as Symantec

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[655] *Ibid.*

[656] *Ibid.*

[657] Windows Internet Explorer is a product of Microsoft Corporation.

[658] Apple Safari is a product of Apple Inc.

[659] Mozilla Firefox is a product of Mozilla Corporation.

[660] Section 52 *of* the Indian *Copyright Act,* and Section 29 of the Canadian *Copyright Act,*

Corporation,[661] CA,[662] Trend Micro[663] and Kaspersky Lab[664] which have computer programs with deal with computer antivirus. Due to the competition among these companies, the prices of antivirus products have decreased to a mere $ 14 per computer. The competition is so stiff nowadays that these antivirus companies are giving free trial period up to 90 days with full protection. Thus the main essence of this example is that competition among the computer program developers affects the price of the computer programs. However on the other hand due to the stiff competition among the computer program developer the consumer profits from the various types of products available to buy, at negotiable costs, which are favourable to them.

C. Reverse Engineering

Reverse engineering, as the name suggests, is the opposite to the process of constructing a computer program.[665] Reverse engineering involves going backwards from a finished product and determining how the product works.[666] Another definition holds that reverse

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[661] Symantec Corporation is the maker of personal computer security software. It has products such as: Norton 360, Norton Antivirus, Norton Internet Security. Online: < http://www.symantec.com/index.jsp>. (Last visited 04.07.2010).

[662] CA Inc. is a computer security company. It has products such as: CA internet security suit, CA antivirus plus Antispyware. Online: < http://www.ca.com/us/default.aspx>. (Last visited 4.07.2010)

[663] Trend Micro is a computer security company. It has products such as: Trend Micro Internet Security Pro, Trend Micro Internet Security, Trend Micro Antivirus plus Antispyware.
Online < http://housecall.trendmicro.com>. (Last visited 4.07.2010).

[664] Kaspersky Labs is a computer security company. It has products such as: Kaspersky Internet Security, Kaspersky Antivirus. Online: < http://www.kaspersky.com>. (Last visited 4.07.2010).

[665] Sunny Handa, "Reverse Engineering Computer Programs under Canadian Copyright Law" (1995) 40 McGill Law Journal 621 at 621. [*Handa*]

[666] *Ibid.*

engineering occurs where "one inspects or takes apart a new product ... by translating the unreadable object code of a program into source code that may be studied".[667]

According to the present copyright laws, reverse engineering of computer programs is permissible in India and Canada if the act falls under one of the exceptions laid down in the Copyright Acts.[668]

Even though reverse engineering can be useful for understanding the product, it has a certain disadvantages. The computer program developers, being experts in their field can, by way of reverse engineering, extract the source code. This extracted source code can then be used by the computer developers to formulate new computer programs which do not infringe the copyrighted computer program. This results in similar products, thereby creating competition for the copyrighted computer program. Thus, though reverse engineering could be useful for understanding the computer programs; it could be used as a shield to formulate similar computer program to the copyrighted computer program.

D. Difficult to Prove Copyright Infringement

A further potential disadvantage of copyright is the difficulty of proving copyright infringement. As a general matter, it is easier to prove patent infringement than copyright infringement because copying need not be proved and also the patent claims provide a

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[667] *Ibid.*

[668] *Supra* note 660.

clear framework for determining infringement.[669] In contrast, to prove copyright infringement, the plaintiff must prove intentional copying, usually by showing access and substantial similarity which is difficult to prove.[670]

Furthermore, the registration of copyrights is not required under the copyright laws. Thus proving the first person to make the computer program is also difficult. To sum up, copyright requires high standard of proof for the computer program developers to seek protection under this legal umbrella.

4.2.1.2. *To the Consumer*

A. Locking of Knowledge and Royalty

Granting copyrights to computer programs would result in locking the knowledge of the computer program, from the public, for a long period of time. As per the present copyright laws in most of the countries including Canada and India, the term of legal protection is life of the author plus an additional 50-60 years.[671] Thus copyrights grant a long term of protection which in some cases may range for more than 100 years.[672] During the period of the protection, the copyright holder is the sole owner of the

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[669] William van Caenegem, *Intellectual Property Law and Innovation* (New York: Cambridge University Press, 2007) at 162.

[670] *Ibid.*

[671] Section 22 to 29 of the Indian *Copyright Act,* 1957,14 of 1957 states the term of the copyright to be life of the author plus 60 years and Section 6-12 of the Canadian *Copyright Act,* R.S.C. 1985, c. C-42 states the term of the copyright to be life of the author plus 50 years.

[672] More than 100 years is a result of adding average life span of a human being which is 70 years and the term of the protection after his death which is 50-60 years.

computer program. Any person who would want to use the computer program or a part of the computer program would have to take permission from the copyright holder, who on the other hand could ask for royalty, for the period, of the use of the computer program. Furthermore, in case the new user discovers a new computer program, he or she would incorporate the cost of the royalty that he or she had to pay to the previous copyright holder, in setting the price of the new computer program. This would result in increasing the price of the computer program which would further affect the consumers, as they would have to shell out more money to buy the computer program. On the other hand, in case the new user would want to use the copyrighted computer program without any interference by the copyright holder, he or she would have to wait for more than 100 years, which is beyond the average life span of a human being, to get the computer program.[673] Software technology being dynamic in nature, has an average life span of only six months, locking free use of the computer program for such a long time, will also be against the software development. Thus for the reason stated above, copyright locks the free use of knowledge for a very long time.

4.2.2. Advantages of Copyright Protection to Computer Programs

4.2.2.1. *To the Computer Program Developer*

A. Automatic, Easy Applicability and Requires no Formality

Under both Indian and Canadian copyright laws there is no mandatory provision for registration of copyrights. While registration helps support presumption of validity in

[673] Average life span of a human being is around 70 years.

case of infringement, it is not a mandatory pre-requisite under Indian and Canadian copyright laws. On the other hand registration of copyright is easy and cheap and it takes less time than registration of patents.

Furthermore, under copyrights there is no need for publication of the intended computer program to be copyrighted. As soon as the computer program developer puts it on a paper or saves it on his computer, the product becomes a copyrighted document. No publication of the product, helps in keeping the product as a secret from other computer program developers, making the computer program developer the sole owner and user of the copyrighted computer program, for the term of the legal protection. Thus copyright protection is automatic and requires no formality.[674]

As compared to patent laws, the present copyright laws expressly state that computer programs are copyrightable under literary works.[675] Thus there are precise provisions in the copyright laws which deal with computer programs. This helps the developers to know what their rights are and what the consequences are in case they are found guilty of infringement.

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[674] *Mark Perry, supra* note 40.

[675] Section 2 (o) of the Indian *Copyright Act,* 1957, 14 of 1957 and Section 2 of the Canadian *Copyright Act,* R.S.C. 1985, c. C-42.

4.2.2.2. *To the Consumer*

A. New and Cheap Computer Program Products

Granting copyrights to computer program helps in advancement of software technology. As copyright laws protect only the expression and not the idea, computer program developers can make new products which are based on the same idea.[676] This results in similar computer program doing similar functions.[677] Thus in the market, there will be various computer program developers having similar computer programs. This will raise competition among the computer program developers making them lower their computer program prices according to the increase in the competition. On the whole the increase in competition will eventually be advantageous to the consumer as the consumer will get a large variety of similar products to choose from and can buy computer programs which suit their budget. Furthermore, competition among the computer program developers will generate new computer programs faster which will eventually result in advancement of software technology.

4.3. Conclusion

After analyzing patent and copyright laws, and understanding their relative advantages and disadvantages to consumer and computer program developers, we can see that patents and copyrights effects both the consumers and computer programs developers.

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[676] *Gupta, supra* note 647.

[677] *Ibid.*

Taking both sides into consideration is necessary to conclude which side outweighs the other.

Weighing the advantages and disadvantages of granting patents to computer programs, as seen above, we can conclude that patents have a positive as well as negative effect on the computer program industry. Patent on one hand discourage small and medium sized enterprises in some cases but on the other hand is the only legal protection which gives high reward to the computer program developers. This reward system on the whole, encourages young and new computer program developers to invent new computer programs. Further, we may infer from the analysis above that granting of patents to computer programs would lead to instability in patent law application as it would be difficult to do a 'prior-art' search, however many countries are trying to eradicate this problem by classifying certain types of computer programs under certain categories. For example, business methods are *per se* unpatentable in many countries however due to the increase in the applications relating to business methods being part of a process or an apparatus, the International Patent Classification has started to categorise these kinds of patent under a subgroup G06F 17/60.[678] This kind of category should be made available for other types of computer programs, when they are a part of a process or an apparatus. The only major disadvantage that we can infer from the analysis is that the cost of application for computer programs is so high that computer programs developers would consider keeping it a secret or apply for copyright rather than apply for a patent.

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[678] *Supra* note 442.

Looking at the copyrights as a protection for computer programs, we can conclude from the analysis, that copyrights also have a positive as well as negative effect on the computer program industry. Copyright protection being automatic, easy and requires no formality, is considered by most of the countries as the appropriate protection for computer programs *per se*. Most of the computer programs comprise of algorithms and are considered as a part of literary works. Because of this reason, most of the countries have provisions to protect computer programs *per se* under their copyright laws. One major disadvantage that we can conclude is that if computer programs are protected under copyright laws, there may be instances where the source code could be copied by any other computer program developer. To protect computer program developers from such scenarios, the computer program developer can add hidden 'tracking codes' in the source codes. These 'tracking codes' can help the copyright holder to find out and prove that his or her product has been copied without his or her permission.[679] Furthermore, one of the apprehensions that a computer program developer might have with using copyright protection is that copyright protects the expression of the software and not the idea therefore the developer may feel that he might lose his monopoly in the market easily by opting for copyright protection for his or her product. But this is not the case, the estimated life span of computer program is six months after which the technology usually changes and becomes outdated. In most of the cases, this time period of six months is short for competition to develop a similar program. Therefore during the initial period

[679] In some computer programs, the computer program developers can add algorithms or codes which do not relate to the computer program and do not interfere in the functioning of the computer program. When a computer program source code is copied illegally by any other programmer, these algorithms or codes also get copied. These lines of algorithms and codes can then be used by the copyright holder to prove that his or her product has been copied illegally.

of innovation, the computer program developer will have full monopoly over his program and can earn monopoly profits.

From a consumers' perspective, patents grant a monopoly to the computer program developers by enabling computer program developers to decide the price and type of computer programs. This makes the consumer at the mercy of computer program developers. Furthermore, patents lock the knowledge of the computer program from the consumer for twenty years. The life of the computer programs being six months on an average, giving protection for 20 years will be against the advancement of software technology. However one important benefit of patenting system is that it helps in disclosure of the new invention to the public. Though the public cannot use the exact method to make another invention, as it is patented, they can use the information disclosed in the patent application to build new advanced inventions, which would help in advancement of software technology.[680] On the other hand, copyrights are also advantageous to the consumers. As copyright encourages similar products it will result in competition among computer program developers. Competition among computer program developers will further result is appropriately pricing of the computer program as the computer program developers would want the consumers to buy their products and remain in the competition. This competition among the computer program developers

[680] For example MagicJack was the sole device which made voice calls over voice over internet protocol (VOIP) platform with the aid of a computer. However now a new device known as NetTalk has been disclosed which also makes voice calls over VOIP platform but doesn't require any help of a computer. The main essence of this example is that disclosure of patent inventions help in making new improved inventions. Online: MagicJack <www.magicjack.com>, NetTalk <www.nettalk.com>. (Last visited: 24.07.2010).

would be advantageous to the consumer as they would have to shell out less amount of money for the computer programs needed.

After weighing the advantages and disadvantages of using patent and copyright to protect computer programs and seeing the wide variety of usage of computer programs nowadays,[681] we can conclude that both the protections are important in today's scenario. Copyrights on one hand are not appropriate to protect computer programs when they are in a technical nature i.e. when computer programs are attached to an apparatus or are a part of a process. Patents are the appropriate protection for computer programs, in these scenarios. Furthermore, granting patents to written computer programs would be absurd as it would bring literary works under the purview of the patent laws. For literary works copyright protection is the appropriate protection. Thus after reviewing the analysis above and keeping in mind today's scenario, copyright protection as well as patent protection, is the appropriate protection, for computer programs.

[681] Refer 3.3. After 2002, to see the wide variety of usage of computer programs.

Chapter Five: Conclusion

This thesis sets out to: Show how the evolution of computer program protection under intellectual property rights has led to divergent approaches in Canada and India; Study the current legal approach adopted by the Canadian and Indian courts while recommending a future approach that can be adopted by both countries; and Determine the appropriate protection for computer programs from the point of view of computer program developers and consumers.

5.1. Summary of the Observations made in this Thesis

It appears from the legal literature in Chapter 3 that Canada was the first among the two jurisdictions to protect computer programs under the intellectual property regime. As software technology evolved, Canadian courts broadened the ambit of intellectual property rights in order to bring the new technology under its legal umbrella. Analysis of the Canadian jurisprudence in this thesis shows that the protection of computer programs has been an evolutionary process based on legislative language and court interpretations. On the other hand the intellectual property protection for computer programs in India developed due to the implementation of the *Trade Related Aspect of Intellectual Property Rights* agreement, signed by India in 1995. Following the agreement, legislative amendments were made to the Acts which brought computer program protection to India. Thus I can conclude that protection of computer programs in India was a result of signing of the international treaty and is based upon the global consensus for protecting computer

programs. In spite of the divergent approaches taken up by India and Canada to arrive at appropriate protection for computer program, both the countries protect computer programs under patent and copyright.

Furthermore, Chapter 3 traces the current legal approach applied by the Canadian and Indian courts to combat the problem relating to protecting computer programs. As seen in Chapter 3, some of the vital aspects of software technology such as reverse engineering and business methods have not yet been clarified by either the Canadian and Indian courts or legislatures. There is still a lot of confusion regarding this aspect of intellectual property rights. Thus to clarify this confusion, this thesis summarizes and recommends the following approach for different elements of computer programs:

A. Protection of Literal Elements in a Computer Program

From the analysis in Chapter 3, this thesis concludes that both the Indian and the Canadian copyright laws have precise provisions for the protection of literal elements in a computer program. These provisions state that literal elements in a computer programs are to be protected under copyright. As literal elements in a computer program are similar to traditional works such as books and journals, this approach adopted by both jurisdictions is appropriate and is feasible for advancement of software technology.

B. Protection of Non-Literal Elements in a Computer Program

As regards to protection of non-literal elements in a computer program, Chapter 3 concludes that Canadian courts apply the test laid down in *Delrina.*[682] However no case dealing with the protection of non-literal elements of a computer program has been brought in India. As the Indian courts do not have any precedent to rely upon, when faced with a similar issue, they will take into consideration case laws from other Commonwealth countries. Canada, is a member of the Commonwealth, has examined this issue in *Delrina*[683] and took into account both U.K. and U.S. jurisprudence. This is the perfect example for India to adopt. In order to appropriately protect computer programs, Indian courts can adopt the approach laid down by the Canadian courts for protecting the non-literal elements in a computer program.

C. Reverse Engineering:

Chapter 3 concludes that both Canada and India have clauses in their copyright laws which deal with the exceptions to the exclusive rights of the copyright holder. These exceptions allow 'Reverse Engineering' of computer programs in situations where the act falls under the 'fair-use' clause. However, to date, neither Canadian nor Indian courts have ruled upon cases relating to 'Reverse Engineering'. Looking at it from a social perspective, the copyright exception of

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[682] *Delrina appeal, supra* note 498.

[683] *Ibid.*

'Reverse Engineering' helps to keep a balance between long term protection and public knowledge. Furthermore, the USA and the European Union have also adopted this 'fair use' clause and are allowing 'Reverse Engineering' of computer programs.[684] Thus, this approach followed by the both the jurisdictions relating to reverse engineering is in consonance with the global scenario and is a necessity for software development.

D. Computer Program Related Inventions:

As regard to inventions involving computer programs, Chapter 3 states that in Canada and India, inventions involving computer programs are patentable. However, it is difficult in India to issue a patent on an application which deals with inventions involving computer programs because of the added requirement of industrial applicability. As most of computer programs do not have industrial applicability, the industrial applicability requirement, results in fewer patents for inventions involving computer programs. This approach seems to be more logical as it does not limit the growth of software technology due to patents. Thus, this approach should be followed by the Canadian Patent Office so that fewer inventions involving computer programs are issued patents, resulting in faster advancement of software technology.

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[684] *Handa, supra* note 665 at 621.

E. Business Methods Patents:

Business methods *per se* are not protected under the patent laws of Canada and India. This approach by both the countries is suitable as granting patents to business methods would involve a radical departure from the traditional patent regime. The traditional patent regime had been made to protect fields of technology. Thus economics, commerce, accounting, recordkeeping, marketing, and law are not themselves fields of technology. However there is possibility that relevant inventions in their practice might use the aid of technology, bringing them under the purview of the patent laws. This possibility has been rightly upheld by the *Indian Patent Act* and the *Canadian Patent Act*. Thus for the reasons laid down in Chapter 3,[685] Canada and India should continue protecting business methods, in certain circumstances,[686] as it is important for the steady growth in software technology.

One major conclusion that I can draw from the comparative study of computer program protection is that both Canada and India have come to a common consensus that

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[685] Reasons for allowing business method patents in Canada for certain circumstances have been summarized in 3.3.3 Conclusion.

[686] To date, Canada and India do not have a separate test to find out whether business methods, in certain circumstances, are patentable under the patent laws. The only test both the countries follow is the traditional criteria test for patents, which is, inventions are patentable only if they are new, non-obvious and possesses utility (and, in case a patent is applied in India, the inventions should also possess industrial application). However due to the increase in the business method applications in both the countries, the Patent Office's should formulate a separate test for business methods.

copyright, in certain circumstances and patent, in certain circumstances, are the appropriate protection for computer programs.[687]

To further uphold the above conclusion, after analysing Chapter 3 and Chapter 4, I can conclude that copyright and patent both are required in today's scenario to appropriate protect computer programs. Nowadays computer programs are not only used in literary fashion but are also used in inventions. Granting copyrights in these circumstances would not be appropriate. On the other hand the analysis also proves that computer programs cannot only be given patents. When computer programs are in the form of literary works, copyright protection has to be given. This has been rightly upheld by many countries including Canada and India, as they consider computer programs *per se* protectable under the copyright laws. Thus this thesis concludes that depending on the circumstances, patent or copyright, are the appropriate protection for computer programs.[688]

5.2. Future Research

This thesis is the first study of its kind to compare the jurisprudence of Canada and India in the field of software technology. Both countries, being common law nations, have similar legal structures, and can learn from each other's scenarios and interpretations of law. They can use each other's approaches to tackle situations where the law is silent.

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[687]Copyright is the appropriate protection when computer programs are considered in literary form, such as, SSO, source code, interface etc. Patent is the appropriate protection when computer programs are used in a technical way i.e. when computer programs are used as a part of an apparatus or a process in an invention.

[688] *Ibid.*

For this thesis, it was not possible to analyse the jurisprudence of the USA. The USA is a forerunner in software technology, and the jurisprudence of the USA impacts the legal jurisprudence of other countries. Furthermore, in this thesis, the impact of software technology and the legal protection on the economies of the countries was not addressed. Another important aspect that the thesis lacks is the use of protection, such as trade-secret law and contract laws as means to protect computer programs, in both the jurisdictions.

Possible suggestions for further research using this thesis involve the impact of USA jurisprudence on Canadian and Indian jurisprudence. In addition, future research can also look at the consequences of jurisdiction-shopping[689] by computer program developers. Another aspect that can be further researched is the difference in the application of patent and copyright laws when the development of computer programs is outsourced from Canada to India or vice-versa. Lastly, when more case law accumulate in Canada and India relating to computer programs, this study could be advanced on a larger scale, focusing on the conclusion, whether it holds true or not, when the larger economic picture is considered, along with other international players, in the software market.

[689] The term jurisdiction-shopping refers to the practice adopted by some computer program developers to get their computer program marketed or developed in the country which is most likely to be of the greatest benefit, either due to favourable intellectual property protection or due to easier enforcement of the rights that they need. Through jurisdiction-shopping, a computer program developer can choose the country or region which helps him or her to yield maximum profits or other benefits. Jurisdiction-shopping can have beneficial as well as detrimental consequences on the software market of the country or region chosen for these activities. This scenario should be further researched.

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