

**COMPUTER SOFTWARE  
AND  
INTELLECTUAL PROPERTY RIGHTS**

*(Summary: This paper discusses, how intellectual property rights operate in the field of computer software.*

*It was read by Justice Yatindra Singh Judge Allahabad High Court on 15<sup>th</sup> March 2008 at National Conference on Advancements in Information Communication Technology Allahabad)*

Justice Michael Kirby is a puisne judge in the High Court of Australia, the highest court there. On 21<sup>st</sup> February 2008, Justice Kirby was the chief guest in the annual dinner meeting of Internet Industry Association Sydney, Australia. The audience here, reminds me of his speech on that occasion,

'The people who built the Internet ... have ... extra dimension. I asked tonight when I came in here and saw you all: why is this such a male dominated audience? Why are there so few women?

If I were to go to a Law function tonight, about half the audience would be women – and the same in most professions. But here, this is overwhelmingly a male domain.

My conversationalist said, it all goes back to the fact that to be good in this type of technology, you have got to have that very strange mental quirk. And that's a male phenomenon. It's on the Y chromosome, in the male genes. That's probably why they are mostly men here.

I don't know that I accept that.

It may be a power thing. You may be just a little bit behind the rest of us in society. But it's a thing for you to look to. Women are the great networkers. And toilers in the Internet are in the business of the greatest network of them all.'

Even I don't accept the explanation offered by the conversationalist however, it is not only a thing to look to but a thing to be look into. With this preliminary, Let's come to today's topic.

**INTELLECTUAL PROPERTY RIGHTS**

Last century was dominated by two wars however this century is likely to be dominated by the problems related to intellectual property rights (IPRs). We are one of the leaders in the field of Information Technology. With better understanding of

Intellectual property rights (IPRs) in the field of computer software, we will be in better position to steer away from the disputes.

About a century ago, Justice Paterson, in *University of London vs. University of Tutorial Process Ltd.* 1916(2) Ch 601, observed,

'What is worth copying, is prima facie worth protecting'

This is the genesis of all intellectual property rights (IPRs). These rights refer to the property that is a creation of the mind: inventions, literary and artistic works, symbols, names, images, and designs used in commerce.

Agreement on Trade related aspect of Intellectual Property Rights (TRIPS)—part of the World Trade Organisation (WTO) Charter—talks about the following seven kinds of IPRs:

- (i) Copyright and Related Rights
- (ii) Trademarks
- (iii) Geographical Indications
- (iv) Industrial designs
- (v) Patents
- (vi) Layout - designs (Topographies) of Integrated Circuits
- (vii) Protection of Undisclosed Information (Trade Secret)

This list of IPRs is enumerative and not exhaustive; there can be other IPRs.

### **IPR Protection in India**

In our country, IPRs are protected under the following Acts.

- (i) The Biological Diversity Act, 2002
- (ii) The Copyright Act, 1957.
- (iii) The Design Act, 2000.
- (iv) The Geographical Indications of Goods (Registration and Protection) Act, 1999.
- (v) The Patents Act, 1970.
- (vi) The Protection of Plant Varieties and Farmers' Rights Act, 2001.
- (vii) The semiconductor Integrated circuits Layout design Act, 2000.
- (viii) The Trade Marks Act, 1999.

TRIPS deals with one more kind of IPR namely Undisclosed information (Trade Secret). There is no specific Act relating to trade secret in our country and it is protected under common law.

Apart from the abovementioned Acts/ area, the law relating to Contract/ License plays important role in protection of computer software.

### **IPRs in the Computer Industry**

IPRs in the computer industry are affected by the following areas:

- (i) Contract/License
- (ii) Copyright and Related Rights
- (iii) Undisclosed Information (Trade Secret)
- (iv) Patents
- (v) Trademarks
- (vi) Layout - designs (Topographies) of Integrated Circuits

The first four have an impact on computer software. The fifth one (trademarks) and the sixth one (layout-designs) are more relevant to the Internet and to computer hardware rather than to the computer software.

### **COPYRIGHT, TRADE SECRET AND CONTRACT/LICENSES**

For sake of convenience, let's take the first three IPRs together—we will discuss patents afterwards.

- **'Contract/ license'** is general law that governs conditions in any transactions. It is equally applicable to the computer software.
- **'Copyright'** lies in the description; it is the form of expression of ideas: this expression may be by artistic, or dramatic, or literary, or musical work; it may be, by films, pictures and sound recordings too. It is governed by the Copyright Act, 1957.
- **'Undisclosed information/ trade secret'** is a secret. It must not be of public or general knowledge in the trade. It may consist of any formula, pattern, device or compilation of information which gives an advantage over competitors who do not know or use it. It implies some novelty though not of the same degree as in the patent law, as that does not possess novelty is usually known.

### **COMPUTER SOFTWARE**

Before we discuss interplay between IPRs and computer software, a few words about computer software will be apt.

#### **Source Code and Object Code**

Computers do not understand our language. They only understand 'machine language' or 'machine code' i.e. instructions which consist of a series of 0s and 1s; the language of 'yes' and 'no'. In the earlier days a computer program used to be written in machine code by punching a punchcard. The punched slot or unpunched slot indicated requisite information to the computer. This process was slow and tedious. Such a programme, although intelligible to the computer, was virtually unintelligible to any one except an equally skilled programmer.



(Computer Punch Card)

As the computer science progressed, so did the method of writing computer programmes. It developed 'assembler languages' and then high-level languages—such as Basic, Fortran, Cobol, Pascal, c++ etc. They simplify the work of a programmer. The use of these high level languages enables a programmer to write a programme in terms that nearly resembles ordinary English, unlike those used in the lower level languages. They also permit complex operations for the computer to be written by a relatively compact commands. Such writing of the programme—as written by a programmer—are known as the source code.

The source code is compiled by a compiler—converting it into the language that computers understand. It is then known as the object code or machine code or binary code or machine language.

### **PROTECTION OF SOURCE CODE**

Source code is a kind of description; a description of the computer program. If it is published then it is a literary work within the Copyright Act and is so protected. If it is not published then it is protected as a trade secret though only, the writer/ owner of the work has the right/copyright to publish it.

### **Propreitary Software**

In proprietary software, the source code is generally never published; it is secret: it is protected as a trade secret.

### **Copylefted and Open Source Software (OSS)**

Everyone is not using copyright or trade secret to prevent others from using computer software without their permission or preserve their rights. They are using copyright in such a way that it does not become the exclusive property of anyone. They are not copyrighting but copylefting it. Copylefting is a new word, new concept.

In order to copyleft a software, the copyright holder publishes the source code with the declaration that everyone has the right to copy, distribute, and modify the software without any payment of royalty or fee provided in case of redistribution of the same software or distribution of the modified software, the source code is also disclosed and similar freedom—as given by the original copyright holder—is given to the others.

Copylefted software is also called free software as there is freedom to modify it. It is also called GPLed software as general public license (GPL) has a condition that copylefts a software.

Software where the source code is disclosed may or may not be copylefted and there can be degrees of copyleftness: it all depends on the terms of the licence under which it is released.

In 1997 free software enthusiast got together to start 'Open Source Initiative' (OSI) a non profit public organisation. It has come out with ten guidelines. In case license conditions, under which that software is released, satisfies them then that software is copylefted to some degree. Software released under the licenses satisfying these guidelines are known as 'Open Source Software' (OSS).

OSI has also identified licenses that satisfy these condition. Among them, in one extreme is the GPL that copylefts the software to the maximum and is viral. At other end is Berkeley Software Distributions (BSD); it copylefts the software to the minimum.

All 'GPLed software'/ 'Free software'/ 'copylefted software' are also OSS; they lie within the sphere of OSS but reverse is not true. In OSS source code is always

published: it is always protected as copyright—subject to the conditions of the license under which, it is published.

### **PROTECTION OF OBJECT CODE**

The question as to how an object code is protected was debateable. The High Court of Australia considered this question in *Computer Edge Pty Ltd v. Apple Computer Inc*, (1986) 161 CLR 171. The court held that the object code is not protected as a copyright. Justice Gibbs, one of the judges in the majority Observed,

‘I have not found anything ... that has persuaded me that [the object code] a sequence of electrical impulses in a silicon chip not capable itself of communicating anything directly to a human recipient, and designed only to operate a computer, is itself a literary work, or is the translation of a literary work within the Copyright Act.’

In India legal provisions were similar. However, before this question could be raised in our courts, we sorted it out by amending the Copyright Act in pursuance of TRIPS by two amending Acts namely Act no. 38 of 1994 and Act no. 49 of 1999. The definition of the 'literary work' in section 2(o) of the Copyright Act was amended to include computer programme as well as computer database. The result is that not only the computer programme (subject code as well as object code) but computer database is also protected as a copyright.

### **PATENTS**

Patentability of computer software is controversial as well as debatable.

Patents can be granted for inventions. The word 'invention' {section 2(1)(j) of the Patents Act} read with the word 'inventive step' {Section (1)(ga) of the Patents Act} means a new product or process that is capable of industrial application. Invention must be novel and useful. It should not be obvious to a person skilled in the art. It must be a significant advance in the state of the art; it should not be an obvious change from what is already known. Generally this is the global law but is being applied differently in different countries (see Endnote-1, for relevant part of TRIPS).

### **Law - US**

Section 3 of the Indian Patents Act explains what are not inventions. Patents cannot be granted for discoveries and inventions mentioned in section 3 of the Patent Act. There is no such limitation in the US law as the Congress intended to include

anything under the sun that is made by man, but the US Supreme Court in *Diamond vs. Chakrabarty*, 447 US 303: 65 L Ed 2d 144 (the Chakrabarty case) (for the facts, see end note-2) held,

‘This is not to suggest that ... [law] has no limits or that it embraces every discovery. The laws of nature, physical phenomena, and abstract ideas have been held not patentable. Thus a new mineral discovered in the earth or a new plant found in the wild is not a patentable subject matter. Likewise, Einstein could not patent his celebrated law that  $E=mc^2$ ; nor could Newton have patented the law of gravity. Such discoveries are manifestation of nature, free to all men and reserved exclusively to none.’

The US Supreme Court in *Parker v. Flook* (437 US 584: 57 L Ed 2d 451) also held that a method for updating alarm limits during catalytic conversion, which is a mathematical formula, is not patentable.

The US Patents Act neither specifically refers to programmes for computers, nor to the business methods. The US Supreme Court in *Gottschalk v. Benson*, 409 US 63: 34 L Ed 2d 273 (the Gottschalk case) held that a computer program—involving a method to convert binary-coded-decimal numerals into pure binary numerals — cannot be patented for the reason,

- The method was so abstract as to cover both known and unknown uses of the binary-coded-decimal to pure binary conversion;
- The end use could vary and could be performed through any existing machinery or future-devised machinery or without any apparatus;
- The mathematical formula involved had no substantial practical application except in connection with a digital computer; and
- The result of granting a patent would be to improperly issue a patent for an idea.

In short, algorithm cannot be patented. A computer program — standing alone or by itself — cannot be patented in the US, but what would be the position if it were a part of an industrial or business process?

### **Industrial Process**

*Diamond v. Diehr*, (1981) 450 US 175: 67 L Ed 2d 155 (the Diehr case) was a case involving a process for curing rubber that included a computer programme. Rubber in a mould is to be heated for a given time according to the Arrhenius equation, named

after its discoverer Svante Arrhenius. The inventor had found a process for constantly measuring temperature inside the mould, which was fed to a computer that opened the mould at the right time. The court by a five to four decision held that a patentable claim does not become unpatentable merely if it uses a mathematical formula, or a computer programme, or a computer. In short, a computer programme may not be patentable as such but may be patentable as a part of an industrial process.

### **Business Methods**

Traditionally, the processes concerned with technology only could be patented. Many other activities including business methods, or data analysis which one would consider processes, were excluded from patents. However, since the Diehr case, there has been a shift in the US. US Patent and Trade Office (USPTO) has issued a Manual of Patent Examining Procedures containing guidelines for patenting inventions. Its earlier policy for computer related inventions {Paragraph 706.03(a)} was as follows {See Hotel Security Checking Co. v. Lorraine Co., 160 F. 467 (2nd Cir. 1908) and In re Wait, 24 USPQ 88, 22 CCPA 822 (1934)}:

‘Though seemingly within the category of a process or method, a method of doing business can be rejected as not being within the statutory classes.’

This was deleted and a new paragraph {706.03(a)} was added,

‘Office personnel have had difficulty in properly treating claims directed to methods of doing business. Claims should not be categorized as methods of doing business. Instead such claims should be treated like any other process claims’.

The aforesaid change was noticed by the US court of appeal in State Street Bank v. Signature Financial Group, 149 F. 3d 1352 (Text of this judgement is also available at <http://cyber.law.harvard.edu/property00/patents/StateStreet.html>) (the StateStreet case) (for facts see Endnote-3) and the court held that,

‘Whether the claims are [patentable or not] should not turn on whether the claimed subject matter does “business” instead of something else.’

The court also held that,

‘To be patentable an algorithm must be applied in a “useful” way.

...

We hold 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'

In short, at present the law in the US is that, 'an abstract idea by itself never satisfies the requirements of the Patents law. However an abstract idea when practically applied to produce a useful, concrete and tangible result satisfies it.

Today, USPTO has one chapter on Patent Business Methods and is granting patents to software techniques for business methods and data analysis, if they are useful. Australia and Japan have also followed suit. Some examples of patents of business methods granted in the US are:

- Single click to order goods in an on-line transaction. This is famous Amazon 1-click patent. It was ruled invalid by USPTO on 9.10.07 {To read the original document, go to USPTO PAIR access site at (<http://portal.uspto.gov/external/portal/pair>), choose the "Control Number" radio button, enter 90/007,946 and submit. Choose 'Image File Wrapper' and select 'Reexam - Non-Final Action' of the date and download).
- An on-line system of accounting;
- In-line rewards incentive system;
- On-line frequent buyer programme; and
- Programmes letting customers set their own prices for hotel booking etc.

However in US, the law whether a computer programme, in conjunction of business methods is patentable or not, is far from settled. The Federal circuit Court in 'In re Bilski case' (for facts, see <http://www.uspto.gov/web/offices/dcom/bpai/its/fd022257.pdf>) has on 1<sup>st</sup> October 2007 ordered (see <http://www.cafc.uscourts.gov/opinions/07-1130%20order.pdf>) rehearing of the State Street Case framing the following five questions:

- (i) Whether claim 1 of the 08/833,892 patent application claims patent-eligible subject matter under 35 U.S.C. § 101?
- (ii) What standard should govern in determining whether a process is patent-eligible subject matter under section 101?
- (iii) Whether the claimed subject matter is not patent-eligible because it constitutes an abstract idea or mental process; when does a claim that contains both mental and physical steps create patent-eligible subject matter?
- (iv) Whether a method or process must result in a physical transformation of an

article or be tied to a machine to be patent-eligible subject matter under section 101?

- (v) Whether it is appropriate to reconsider *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368 (Fed. Cir. 1998), and *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352 (Fed. Cir. 1999), in this case and, if so, whether those cases should be overruled in any respect?

### **Law – Europe**

Article 52(2)(2) of the European Patent Convention 1973 (EPC) specifically states that ‘schemes, rules and methods for performing mental acts, playing games or doing business, and programmes for computers’ will not be regarded as inventions. This is also the law of the member countries of the European Patent convention: computer programmes and business methods cannot be patented there. However in practise, it is not so. : they are generally being granted

The European Patent Office (EPO) is an organization formed by the EPC; it does not work under the European Commission. The EPO and a number of patent offices of the EPC's member countries have been granting software patents if claims are presented as technological advancement rather than just software or business applications. However, there is no consistent practice among them. Nevertheless, the EPO claims that:

- It does not grant patents for computer programmes or computer-implemented business methods that do not involve a technical contribution.
- Its practice to grant software patents is significantly different from that of the USPTO.

In order to harmonise the practise, the European Commission proposed a draft directive in 2002 on the subject. But the text was never agreed upon. Some feared that Europe would get a much more liberal regime, like that of the US. Others feared that they would lose the patent protection they already enjoyed. As a result, on 6th July 2005, the proposal was defeated in the European Parliament. However this means that the inconsistent practice that caused the Commission to seek to clarify the law is still continuing.

### **Law — UK**

The question regarding patentibility of computer software was debated and decided (28.02.2008) in England in *In re Astron Clinica Ltd.* see

<http://www.bailii.org/ew/cases/EWHC/Patents/2008/85.html>). It concerned six applications that claimed to be 'a method of doing X' and 'a device for doing X' by running a suitably programmed computer on the device. It is in effect, a computer programme that carries out the method (for facts of Astron Clinica case, see Endnote-4). These applications were rejected by United Kingdom Intellectual Property Office (UKIPO).

Justice Kitchin of the High Court of Justice, Chancery division noted the difference in practise in applying patent law in European countries by stating that:

'UKIPO considers such claims to be prohibited by Article 52 of the European Patent Convention (EPC). The EPO considers such claims to be allowable if the program has the potential to bring about, when running on a computer, a further technical effect which goes beyond the normal physical interactions between the program and the computer.' (paragraph 1)

...

'it is highly undesirable that provisions of the EPC are construed differently in the EPO from the way they are construed in the national courts of a Contracting state.' (paragraph 49)

The court held that:

'In all these circumstances I have reached the conclusion that claims to computer programs are not necessarily excluded by Article 52. In a case where claims to a method performed by running a suitably programmed computer or to a computer programmed to carry out the method are allowable, then, in principle, a claim to the program itself should also be allowable. I say "in principle" because the claim must be drawn to reflect the features of the invention which would ensure the patentability of the method which the program is intended to carry out when it is run.

...

It follows that these appeals must be allowed. Each concerns a computer related invention where the examiner has allowed claims to, in effect, a method performed by running a suitably programmed computer and to a computer programmed to carry out the method. The Hearing Officer has rejected corresponding program claims on the basis they are necessarily prohibited by Article 52. For the reason I have elaborated, he erred in law in so doing. These cases must be remitted to UKIPO for further consideration in the light of this judgement.'

### **Law – India**

Section 3 of the Patents Act provides what are not invention and cannot be patented. Section 3(k) provides that a mathematical or business method or computer programme *per se* or algorithms is not invention for purposes of the Patents Act (see Endnote-5). The word 'computer programme' is modified by the word 'per se'. This word means standing alone, or by itself, or in itself. It shows that under section 3(k) a computer programme standing alone or by itself can not be patented. Nevertheless it also means that if a computer programme is not standing alone then it may be patented; it leaves doubts regarding its scope. The courts may interpret it in the same manner as the Europeans are doing or could do all the way as is being done in the US: of course its finer boundaries will be determined when courts actually interpret these words.

### **PATENTS – SOME DIFFICULTIES**

#### **Period**

Many feel that patents may not be granted for doing business on the Internet and in any case the period of 20 years is too long as computer technology changes every two years (see 'Patently Absurd' by James Gleick is available at <http://www.around.com/patent.html>).

#### **Method of patenting**

Presently, patent applications for inventions involving computer programme merely contain flow chart but not the source code. Patents are granted in exchange for a full description of the invention as well as how to perform it. In case source code is not disclosed then whether there is full disclosure. These questions need to be addressed judicially.

#### **Software Patents—To be or Not to be**

Many feel that patents may not be granted for doing business on the Internet and in any case the period of 20 years is too long. The question regarding patentibility of computer software or the period for such patentibility should be settled globally. The sooner it is done, the better it would be for the computer software industry.

What may be done till the law is settled: get your software patented. In case it cannot be done due to time or expenses involved, publish it on the website. This would indicate prior art and at least others will not be able to get it patented.

## CONCLUSION

Michael Lewis wrote a book in 1999 on the success story of the Silicon Valley entitled 'The new new thing: a Silicon Valley story'. The most quoted line from this book is, 'The definitive smell inside a Silicon Valley start-up was of curry.' Let's hope that—with a better understanding of role of IPRs in the computer industry—not only inside a Silicon Valley start-up, but also inside the e-World, will there be the smell of curry.

Justice Yatindra Singh

Judge, Allahabad High Court, Allahabad-211001.

Phone: 0532-2420462

Email: [ysingh@allahabadhighcourt.in](mailto:ysingh@allahabadhighcourt.in)

**Endnote-1:** Clause 27 of the TRIPS defines patentable subject matters. The relevant part of sub-clause (1) of clause 27 is as follows:

Subject to the provisions of paragraphs 2 and 3, patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application.

A footnote is inserted here in the TRIPS states,

For the purposes of this Article, the terms "inventive step" and "capable of industrial application" may be deemed by a Member to be synonymous with the terms "non-obvious" and "useful" respectively.

**Endnote-2:** Plasmids are hereditary units physically separate from the chromosomes of the cell. In a prior research, Chakrabarty and an associate discovered that plasmids control the oil degradation abilities of certain bacteria. In particular, the two researchers discovered plasmids capable of degrading camphor and octane, two components of crude oil. In the work represented by the patent application at issue here, Chakrabarty discovered a process by which four different plasmids, capable of degrading four different oil components, could be transferred to and be maintained stably in a single *Pseudomonas* bacterium, which itself has no capacity for degrading oil. The new bacteria were not 'products of nature', because *Pseudomonas* bacteria containing two or more different energy generating plasmids are not naturally occurring.

At present, biological control of oil spills requires the use of a mixture of naturally occurring bacteria, each capable of degrading one component of the oil complex. In this way, oil is decomposed into simpler substances which can serve as food for aquatic life. However, for various reasons, only a portion of any such mixed culture survives to attack

the oil spill. By breaking down multiple components of oil, Chakrabarty's micro-organism promises more efficient and rapid oil-spill control and his patent application was allowed.

**Endnote-3:** Signature was the assignee of the patent. The patent was for data processing system (the system) for implementing an investment structure. The system was developed for use in Signature's business as an administrator and accounting agent for mutual funds. The investment configuration provided the administrator of a mutual fund with the advantageous combination of economies of scale in administering investments coupled with the tax advantages of a partnership.

State Street negotiated with Signature for a license to use its patented data processing system. When negotiations broke down, State Street filed a case for declaration that the patent is invalid. This was allowed by the Massachusetts district court. This judgement was in appeal that was allowed and the case was remanded. It later on ended in compromise.

**Endnote-4:** The facts in the application filed by Astron Clinica are as follows:

- University of Birmingham had developed skin imaging techniques. Astron Clinica was founded to commercialise it.
- The technique enables images of the skin to be processed to identify the distribution and concentration of underlying skin chromophores.
- Distribution and concentration of underlying skin chromophores undergoes a change in case of cosmetic or surgical intervention.
- The application filed by Astron Clinica describes the invention as providing a system and process for generating realistic images representing these changes. It is implemented by programming a computer to process images in a particular way. This is achieved by a disc that causes a computer to be configured so as to undertake the required processing.

Similarly, computer programme was used in the other cases.

**Endnote-5:** Section 3(k) as it stands today was substituted by the 2002 Amendment. It was replaced by section 3(k) and 3(ka) by the Patents Amendment Ordinance 2004 (the 2004 Ordinance). Section 3(ka) as substituted by the 2004 Ordinance excluded mathematical method or business method or algorithms from the field of invention. It was the same as was provided by the 2002 Amendment in Section 3(k). However, the law regarding computer programme was further clarified in section 3(k) by the 2004 Ordinance. After the 2004 Ordinance, computer programme per se was further qualified by the phrase 'other than its technical application to industry or a combination with hardware'. It showed that the computer programme in its technical application to industry or a combination with hardware only could be patented: a scope narrower than US

approach but perhaps wider than European approach. The 2004 ordinance has been repealed by the Patents Amendment Act 2005 (Act 15 of 2005) (the 2005 Amendment) however it left the section 3(k) as was substituted by the 2002 Amendment intact; it did not incorporate the amendments in 3(k) or substitution of 3 (ka) as proposed by the 2004 Ordinance.