

# Software Patentability: A Comparative Analysis

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*Software patenting continues to be ambiguous in respect of patentable subject matter, scope of protection and patent procurement. Conflicting judicial precedents and varying practices across patent offices have only compounded applicants' problems. However, this hasn't stopped the software industry's remarkable growth. While highlighting these, the present article gives an overview of current developments in the area of software patenting and concludes with suggestions on the need to evolve a uniform global framework.*

## 1. Introduction

In this age of third industrial revolution,<sup>1</sup> highly developed software production occupies an increasingly important position.<sup>2</sup> This industry has seen unprecedented growth and is dominant in almost all aspects of modern life. Thus, the need to establish an appropriate scope and legal boundaries for its protection seem to be a matter of crucial importance.

Copyright and patent are two possible forms of intellectual property rights under which computer software might be protected. Which among the two is the best mode for software protection has been a matter of great debate. Countries have adopted different approaches. Even the TRIPS which intended to harmonise the patent systems of World Trade Organization (WTO) members failed to reconcile the differences.<sup>3</sup>

The debate concerning the software patent lies on two fronts—first, whether computer software is patentable subject matter and if yes, then second, what should be the scope of patent protection. On both these fronts, differences exist but in the mean time many software patents have been granted by major patent offices throughout the world and this has resulted in different standard of protection through the evolution of different examination guidelines and case laws.

Keeping this divergence of regulatory approaches in view the present article tries to make a comparative analysis of the laws relating to software patents in different jurisdictions. Part I summarises the software patentability debate. Part II deals with patentability of software programs under different regimes, i.e. TRIPS, United States, European Union, Japan and India. Part III gives a comparative overview and Part IV provides conclusion.

### Part-I

## 2. Software and the Patent/Copyright Dilemma

The emergence of software patent has been controversial and vigorously opposed by various interested parties including academicians, companies and professional bodies.<sup>4</sup> While those in favor of software patent argue that there is no reason why new and unobvious software programs should not be considered patentable.<sup>5</sup> The opponents have given compelling reasons to hold that computer software should not be patented. They say that software is more a piece of literature, is an abstract idea, describes a mental act and lacks inventiveness and thus non patentable.<sup>6</sup> In the light of these academic differences different countries have formulated different policies and regulatory regime, while various countries have explicitly allowed for software patents, others till this date have no specific legal rules with regards to patenting software or algorithms. As the scope of the present article is limited to comparative analysis of software patenting, the writers would restrict themselves and would like to move on to the comparative positions existing in countries with leading patent regimes.

## Part-II

### 3. Comparative Position

This section looks to the laws and experiences of different countries with the objective of evaluating and learning from their experiences. It begins with an examination of how TRIPS engages with the issue of software patentability, thereby binding its signatories and then moves on to examine the paradoxically divergent regulatory approaches of the US, EU, Japan and India.

#### 3.1 Software Patenting under the TRIPS<sup>7</sup>

TRIPS ensures minimal rules for national protection of intellectual property rights. With respect to computer software two articles become very important, first, Article 27 and second Article 10. Article 27 provides that “patents shall be available for any inventions... in all fields of technology provided that they are... capable of industrial application”.<sup>8</sup> On the other hand, Article 10 states that “computer programs, whether in source or object code, shall be protected as literary works (copyright) under the Berne convention”.<sup>9</sup>

Thus, these two articles create an interesting internal contradiction with respect to software.<sup>10</sup> It has been argued that under TRIPS a given intellectual achievement should only attract one form of protection. Since TRIPS explicitly provides that computer programs are protected under copyright they should not be protected by patent law under Article 27.<sup>11</sup> The converse of this argument is that TRIPS simply provides a minimum level of protection under Article 10 – permitting individual nations to decide what subject matter should be patentable under Article 27. On this view computer programs are more than simply lines of code but have functional aspects.<sup>12</sup> TRIPS in and of itself therefore does not appear to definitively answer the question of software patentability.

#### 3.2 United States (US)

To start with, US Courts treated software patenting suspiciously and on several occasions held that software is essentially a mathematical formulae<sup>13</sup> and thus, not patentable under US law. However, after *Diamond v. Diehr*,<sup>14</sup> the position was changed by the Court holding that the invention should be looked at as a whole and patent protection should not be denied solely because it contains mathematical formulae. But, two exceptions remained in place: first, the mathematical algorithm exception and, second, the business method exception.

In *Diamond v. Diehr*,<sup>15</sup> the patent application covered an improved method of curing rubber, accomplished by using a computer to constantly recalculate the proper curing time based on a known formula. It was held that the patent claim described a method for curing rubber, which was an industrial process clearly under the purview of the Patent Act and it did not seek to preempt the use of a mathematical formulae. Thus, the Court stated that the mere inclusion of a computer program and a mathematical equation did not render the subject matter non-statutory.

Subsequent to *Diehr*,<sup>16</sup> Court of Custom and Patent Appeals (CCPA) in an effort to scrutinise the patentability of the inventions involving a mathematical algorithm introduced a two step test, known as the Freeman Walter Abele test.<sup>17</sup>

- (i) The claim is to be analysed to determine whether a mathematical algorithm is directly or indirectly recited; and
- (ii) If a mathematical algorithm is found, the claim as a whole is further analysed to determine whether the algorithm is applied in any manner to physical elements or process steps.

If both the tests are answered in the affirmative, the claimed invention is patentable.<sup>18</sup> However, there has not been uniformity in application of these tests. For Example, in *Alappat*,<sup>19</sup> the Court returned to the primary authorities<sup>20</sup> instead of applying these tests to rule that while software as a subject matter could not be patented, the claim involved a practical application of the subject matter, and thus the overall invention could be patented. Finally, in *State Street Bank & Trust Co.*<sup>21</sup> while holding that even a computerised business method is patentable if it produces “a useful, concrete and tangible result,” the Federal Circuit explicitly rejected the Freeman-Walter-Abele test stating that:

After *Diehr* and *Chakrabarty* the Freeman-Walter-Abele test has little, if any, applicability to determine the presence of statutory subject matter.<sup>22</sup>

It is evident from case law that software must accomplish a practical application and it must be more than a manipulation of an abstract idea in order to be eligible for patenting. The purpose of this requirement is to limit patent protection to inventions that possess a certain level of real world

value, as opposed to subject matter that represents nothing more than an idea or concept, or is simply a starting point for future investigation or research.

The Examination Guidelines for Computer Related Inventions provide that to be statutory subject matter, a claimed computer-related process must either:

- Result in a physical transformation outside the computer for which a practical application in the technological arts is either disclosed in the specification or would have been known to a skilled artisan, or
- Be limited to a practical application within the technological arts.<sup>23</sup>

According to the Examination Guidelines, there are two types of processes which are considered statutory subject matter, i.e. Post-Computer Process Activity and Pre-Computer Process Activity. Post-Computer Process Activity performs independent “physical acts” outside the computer after the internal computer program steps have been completed, while the Pre-Computer Process Activity performs independent “physical acts” outside the computer before the internal computer program steps have been completed. Therefore, if a claimed process falls into one or both of those categories, it is clearly statutory. In practical terms, claims define non-statutory processes if they:

- Consist solely of mathematical operations without some claimed practical application (i.e. executing a “mathematical algorithm”); or
- Simply manipulate abstract ideas without some claimed practical application.

US is regarded as the most liberal system for software patenting and in diverse cases it has found that software is patentable. Some of the illustrations are:

- (i) Computer algorithms unrelated to mathematics have been found patentable<sup>24</sup>
- (ii) Computer algorithms that pertain to the operations of the hardware have been found patentable<sup>25</sup>
- (iii) Processes or apparatus that use computer programs as a component of the overall invention have been found patentable.<sup>26</sup>

In spite of this vast jurisprudence, the scope of software patentability can not be said to be settled in US. This becomes evident from the latest case of *In re Bilski*<sup>27</sup> which is presently being argued at the Supreme Court. In this case, the applicant filed a patent application for a method of hedging risk in energy commodities trading, something which traders do and have always done. The USPTO rejected the application, and the CAFC agreed, holding that patents could only be granted for processes, including software, when the patent claims to include a “specialised machine” or a “transformation of matter”. This judgment is important as it expressly held that *State Street Bank v. Signature Financial Group*<sup>28</sup> should no longer be relied upon. As a result of this case new vistas have been opened for the software patentability debate and certainly after the Supreme Court decision new dimensions relating to software patentability may emerge.

### 3.3 European Union (EU)

In Europe, the debate over software patenting has always been marked by conflicts and controversies. Here, the European Patent Convention<sup>29</sup> provides that, in order to be patentable, an invention has to be susceptible to industrial application, it has to be new and it must involve an inventive step.<sup>30</sup> Article 54 of the EPC describes the requirement of novelty, and states that:

An invention shall be considered to be new if it does not form part of the state of art.

Further, Inventive step has been defined in Article 56:

An invention shall be considered as involving an inventive step if, having regard to the state of the art, it is not obvious to a person skilled in the art...

And lastly, industrial applicability has been defined under Article 27 as follows:

An invention shall be considered as susceptible of industrial application if it can be made or used in any kind of industry, including agriculture.

It should be noted that Article 52(2)(c) of the EPC specifically excludes “methods for ... doing business, and programs for computers” from the definition of inventions eligible for patent protection. In spite of this express exclusion the European Patent Office has granted more than 30,000 software-related patents since 1978.<sup>31</sup>

It has been done on the basis of Article 52(3) of the European Patent Convention, which provides that:

Paragraph 2 shall exclude the patentability of the subject matter or activities referred to therein, only to the extent to which a European patent application or European patent relates to such subject matter or activities as such. (Emphasis supplied)

Consequently, Article 52 is construed as precluding only the patentability of software as such. It is only the presence of this “as such” clause that has allowed the European Patent Office<sup>32</sup> to accept patent applications that appear to be excluded as computer software inventions.

While considering whether the subject matter of an application is an invention or not the EPO puts emphasis on the requirement of “technical character” which is stipulated in Rules 27(1)<sup>33</sup> and 29(1)<sup>34</sup> of the EPC. For a computer program to qualify as having technical character, the program should solve a technical problem; or have a technical effect; or require technical considerations.<sup>35</sup>

An example is the *Viacom* case<sup>36</sup> where the Board of Appeal granted a patent for a method and apparatus for improved digital image processing. In this case, the application covered a method for digitally processing images stored in a digital format. Here, the patent was granted on the ground that the claim was directed to a technical process in which the method used does not seek protection for the mathematical method as such. In fact, the EPO Boards of Appeal and national Courts took the view that computer-implemented inventions can be regarded as patentable when they have a technical character. Indeed, in the *Computer Program Product I and II* cases,<sup>37</sup> the Board of Appeals held that if a program on a data carrier has the potential to produce a technical effect when run on a computer, the program itself should not be excluded from patentability.

In *Koch & Stezel*,<sup>38</sup> the issue was related to a computer-controlled X-Ray machine and the Board of Appeal of the EPO held that:

An invention must be assessed as a whole. If it makes use of both technical and non-technical means, the use of non-technical means does not detract from the technical character of the overall teaching.

In *Queueing System* Case,<sup>39</sup> the software based system assigned priority and sent messages signaling availability of services to customers located at multiple service points. In effect the software was merely a component of a larger electronic system. The Board held that the invention was inseparable from the included apparatus and technical innovation existed as whole of the process was carried out without human intervention and thus it escapes the exclusion of Article 52.

In *Controlling Pension Benefit Systems/PBS Partnership*,<sup>40</sup> the application involved a method for calculating pension benefits using a computing apparatus. The EPO rejected the initial application as a business method excluded under Article 52. On appeal, the EPO Board of Appeal stated that:

The specific wording of Article 52(2) of EPC referred to schemes, rules and methods as being excluded from patentability, but had no mention of an apparatus as being excluded from patentability...Methods only involving economic concepts and practices of doing business are not patent eligible, however, an apparatus constituting a physical entity or concrete product, suitable for performing or supporting an economic activity, is an invention within the meaning of Article 52(1).

Thus, in this case the Board took complete retreat from the technical contribution requirement, and concluded that Article 52(1) of the EPC does not exclude any concrete apparatus embodying software from being patentable.

After *Pension Benefit Systems*, the EPO Boards of Appeal abandoned the technical contribution test in favor of interpreting the inventive step requirement to be satisfied only for inventions with a technical character.

In EU, it is difficult to derive from the cases any general test that would determine the exact nature of a technical character. And thus, the European Commission made an effort to harmonise the state laws in EU in 2002 by bringing in new Directives<sup>41</sup> but this effort was fruitless as the proposal was voted out by the European Parliament. Thus, uncertainties still exist with respect to meaning of “technical problem” and need to be clarified.

### 3.4 Japan

Japanese patent law is inspired from both European as well as U.S. experience.<sup>42</sup> Thus, while it gives a lenient definition of Invention<sup>43</sup> which can easily provide for software patentability, at the same time, it has adopted the test of technical contribution at the review level akin to that of EU.

Japan being a civil law country does not have case law to provide guidance. Therefore, relevant patent law is embodied in statutory law and administrative guidelines especially the “Guidelines for Computer Software Related Inventions”<sup>44</sup> as provided by the Japanese Patent Office.<sup>45</sup> There have been several versions of the Software Guidelines<sup>46</sup> the latest being brought in force in the year 2005.

The Software guidelines expressly exclude mathematical methods from the purview of patentable subject matter.<sup>47</sup> However, it recognises software as statutory invention which is handled as an invention of product. Therefore, even computer programs which are not recorded on any medium can now also be treated as a “product invention”. It provides that to qualify for patentability, information processing by the software should be specifically defined using hardware resources and should be constructed by a concrete means in which software and hardware resources are working cooperatively. In addition to this, the Software Guidelines list a number of other requirements for patentability, which are—(1) enabling detailed description, (2) ministerial ordinance, (3) statutory invention and (4) inventive step.<sup>48</sup>

Two Japanese Courts have held that a support system for managing condominium buildings, a message management apparatus, and an apparatus for an auction centre were not patentable because they were “something at which a person skilled in the art could have easily arrived.”<sup>49</sup>

### 3.5 India

In India, Section 3(k) of the Patent Act reads:

(3) The following are not inventions within the meaning of this Act:

(k) a mathematical or business method or computer programme *per se* or algorithms.

As one can see, computer programs are placed in the same category as “mathematical methods”, “algorithms”, and “business methods”.

Thus, similar to EU, computer programs *per se* are not invention for the purposes of the Patent Act. Indian Courts have not interpreted Section 3(k), therefore, we have to resort to foreign cases to interpret the scope of “*per se*”. The 2004 Patent Ordinance that the Parliament rejected in 2005 can also guide us in this process of interpretation. In that ordinance, Sections 3(k) and (ka) read as follows:

(3) The following are not inventions within the meaning of this Act:

(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.

By rejecting the 2004 Ordinance, Parliament has clearly shown that “technical application to industry” and “combination with hardware” does not make a computer programme patentable subject matter.

In 2008, the Patent Office published a new “Draft Manual Of Patent Practice And Procedure” in which it sought to allow patenting of certain method claims for software inventions but even this Draft Manual was withdrawn from circulation. Therefore, the Indian position on software patentability is not clear on account of legislative confusion and dearth of judicial interpretation.

## Part-III

### 4. Comparative Overview and Need to Reconcile the Difference

From the above discussion, it becomes clear that the scope of software patentability is not uniform. Thus while EU lays down emphasis on “technical advancement”, US has followed a much liberal approach and explicitly allows application of a formula. The new USPTO guidelines state that if computer-readable memory influences the way a computer process is carried out, then the patent claim can be awarded. The European approach is much more cautious and requires more detail on the nature of the claim. Thus, in a way we can say that US has taken a pro-software patent approach and the EU, at least at the legislative and judicial levels, calls for non-patentability. Japan on the other hand is in the middle of the two.

These variations in approach become almost contradictory in light of the fact that the US, EU, Japan, and India are all signatories to TRIPS. The malleability of the TRIPS language effectively leaves nation states to their own devices in adopting or discarding software patentability. Therefore, TRIPS, in and of itself, is of little assistance in helping us to clarify the present comparative position. What we can conclude from the above discussion is that the involvement of the judiciary and

legislative branches is critical in establishing, publicising and solidifying a strong position regarding software patentability – regardless of which approach is followed.

#### Part-IV

### 5. Conclusion

Internationally great divergence exists in the level, mode and scope of software protection. In spite of the fact that TRIPS provides for copyright protection for Computer Software it has been argued that it, impliedly, also provides for patent protection. Due to the failure of the international mechanisms to harmonise the law relating to patenting of software, it has largely been developed by the domestic Courts and legislatures which in turn have been greatly influenced by their own interests.

Through this essay we can clearly see the three divergent views existing in US, Japan and EU which has greatly influenced the whole world. On the one hand we have US which seems to grant patents to “anything under the sun made by man”. On the other, we have EU which has always maintained a restrictive approach. Japan’s system of patent law is influenced by both of these and thus it is somewhere in the middle of both.

From the scope of patentability perspective, the US seems to possess the most liberal patent law. Unlike patent law in Europe and Japan, US patent law does not expressly exclude mathematical formulae or software from the definition of patentable subject matter. In fact, it openly recognises the patentability of software.

Further under US law, any new and useful process, machine, manufacture or composition of matter, or any new and useful improvement thereof is eligible for patenting. Unlike the EPO, there is no “technical effect” or “technical contribution” requirement for patent eligibility. The approach of different jurisdictions is not just varied but also, at times, contradictory. In this age of globalisation there is a need to harmonise the law relating to software patents as this would be in the interest of the industry as well as the society. This reconciliation can be brought about under the auspices of the WTO through TRIPS.

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  - 8 *Id.* at Article 27
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  - 12 Miguel E. Sciancalepore, *Protecting New Technologies in Latin America: The Case for Computer Software Patents in Argentina*, 38 U. Miami Inter-Am. L. Rev. 349 (2006), at 375.
  - 13 *Gottschalk v. Benson*, 409 U.S. 62, 72 (1972) (holding that a mathematical algorithm itself is not patentable but adding that it may be that the patent law should be extended to cover programs); *Parker v. Flook*, 437 U.S. 584, 596 (1978) (refusing to overrule or expand *Gottschalk* without a clear signal from Congress).
  - 14 450 U.S. 175, 209 U.S.P.Q. (BNA) I (1991)
  - 15 *Ibid.*
  - 16 *Ibid.*

- 17 This test was derived from the trilogy of cases of the CCPA: In re Freeman, 573 F.2d 1237, 197 USPQ 464 (C.C.P.A. 1978); In re Walter, 618 F.2d 758, 205 USPQ 397 (C.C.P.A. 1980) and In re Abele 684 F.2d 902, 214 USPQ 682 (C.C.P.A. 1982).
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- 19 33 F. 3d 1526, 31 USPQ 2d 1545 (Fed. Cir. 1994)
- 20 Supra note 13
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- 24 In re Toma, 575 F.2d 872, 197 U.S.P.Q. (BNA) 853 (holding that computer program for the translation of natural languages are patentable), See also, In re Pardo, 684 F.2d 912, 214 USPQ (BNA) 673 (holding that computer program for executing several equations regardless of the order of their input are patentable.)
- 25 In re Chatfield, 545 F.2d 152, 156 n.5 (holding that system software are patentable), In re Freeman, 573 F.2d 1237, 197 USPQ (BNA) 464 (CCPA 1978) (holding that algorithm for typesetting alphanumeric equations are patentable), In re Alappat, 33 F.3d 1526, 31 USPQ2d (BNA) 1545 (1994)(holding that waveform smoothing algorithm for oscilloscope is patentable), In re Warmerdam, 33 F.3d 1354, 1360 (Fed. Cir. 1994)(Upholding the patentability of a machine with a collision avoidance memory, In re Lowry, 32 F.3d 1579, 1582 (Fed. Cir. 1994) upholding patentability of a memory with data structure for organizing data).
- 26 In re Abele, 684 F.2d 902, 214 USPQ 682 (CCPA 1982)(upholding the patentability of improved CAT scan procedure), In re Iwahashi, 888 F.2d 1370, 12 USPQ2d (BNA) 1908 (Fed. Cir. 1989) (upholding the patentability of an apparatus for voice pattern), Arrhythmia Research Technology, Inc. v. Corazonix Corp., 958 F.2d 1053 (Fed. Cir. 1992) (upholding the method for analysing electrocardiograph signals).
- 27 545 F.3d 943, 88 U.S.P.Q.2d 1385
- 28 Supra note 20
- 29 13 ILM 268 (1977) (hereafter, referred as EPC)
- 30 EPC, Art. 52(1)
- 31 European Software Patent Statistic, available at <http://eupat.ffii.org/pikta/namcu/> (last visited, 12<sup>th</sup> April, 2010)
- 32 Hereafter, referred as EPO
- 33 Rule 27: Content of the description:
- (1) The description shall:
    - (a) specify the technical field to which the invention relates;...
    - (c) disclose the invention, as claimed, in such terms that the technical problem (even if not expressly stated as such) and its solution can be understood, and state any advantageous effects of the invention with reference to the background art.
- 34 Rule 29: Form and content of claims
- (1) The claims shall define the matter for which protection is sought in terms of the technical features of the invention....
- 35 Wuesthoff and Wuesthoff, Patenting Business methods in Europe: Legal and Strategic Aspects, (2003) Available at <http://www.wuesthoff.de/pdf/wue.PDF> (last visited 12<sup>th</sup> April, 2010)
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- 39 Queueing System/Pettersson Case, T-1002/92 - 3.4.1, 1996 E.P.O.R. 1, 3-10 (EPO Tech. Bd. App. 1994)
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- 45 Hereafter, referred as JPO

- 46 JPO (1975) The Examination Guidelines concerning Computer Software-related Inventions; JPO (1993) The Examination Guideline for Computer Program-related Inventions and JPO (1996) The Examination Guideline for Computer Program-related Inventions
- 47 Supra Note 44, pt. 2, ch. 1, section 1.1(4) (2005).
- 48 Software Guidelines, Supra note 44 Sections 1.2, 1.2.1, 1.2.2, 2.2, 2.3.
- 49 Japanese Patent Office, Major Judicial Precedents of Business Method-Related Inventions 1-2, available at: [http://www.jpo.go.jp/shiryou\\_e/s\\_sonota\\_e/pdf/gjzyutu\\_hanketu\\_e/materials\\_01.pdf](http://www.jpo.go.jp/shiryou_e/s_sonota_e/pdf/gjzyutu_hanketu_e/materials_01.pdf) (last visited 12 April 2010).