

# Software Patents and the Internet of Things in Europe, the United States and India

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*This article sheds light on the pressing issue of software patents by giving an account of the approaches followed in Europe, the US and India. The occasion of this study is the adoption in 2016 of the final version of the Indian guidelines on the examination of computer-related inventions, which have been surprisingly overlooked in the legal literature. The main idea is that the Internet of Things will lead to a dramatic increase of applications for software patents and if examiners, courts, and legislators are not careful, there is a concrete risk of a surreptitious generalised grant of patents for computer programs as such (in Europe) and for abstract ideas without inventive concept (in the US). The clarity provided by the Indian guidelines, following a lively public debate, can constitute good practice that Europe and the US should take into account. Conversely, the sea of patent software looks very stormy in the US, where, after some reversals of the leading case Alice Corp v CLS Bank International, there seems to be the risk of swelling the ranks of speculative schemers who make it their business to watch the advancing wave of improvement, and gather its foam in the form of patented monopolies. Some good news, however, comes from a dissenting opinion that innovatively suggests bringing free speech into the reasoning on patents.*

“Man must prove the truth—i.e. the reality and power, the this-sidedness of his thinking in practice. The dispute over the reality or non-reality of thinking that is isolated from practice is a purely scholastic question.” Karl Marx, *II Thesis on Feuerbach* (1888)

## Introduction

A computer-related invention (CRI; or computer-implemented invention, CII, in the European formulation) involves the use of a computer, computer network or other programmable apparatus, where one or more features are realised wholly or partly by means of a computer program. CRIs and CIIs are a critical topic in patent law, since too relaxed an approach in awarding grants for these kinds of inventions may risk allowing double protection for computer programs: copyright and patents. Thus, too broad a monopoly would be legitimised, with a subsequent increased proprietisation of intangibles. A similar problem can occur in the US, notwithstanding the patentability of computer programs per se. There the risk is the eligibility for protection of mere abstract ideas.

Many countries continue to clearly exclude software patents, and this is the case of Turkey. Indeed, under Madde 6 of the 551 sayılı Patent Haklarının Korunması Hakkında Kanun Hükmünde Kararname (art.6 of Decree-Law No.551 of June 24, 1995 on the Protection of Patent Rights), computer programs fall outside the scope of patent law, being “*Patent Verilemeyecek Konular*” (non-patentable subject-matter). However, the trend seems to go in the opposite direction of recognising patents on CRIs and sometimes on computer programs per se.

This article sheds light on a much pressing issue by giving account of the approaches followed in Europe, the US and India. It is striking how things have changed radically since a study on the said three legal systems was published in this *Review*.<sup>1</sup> The occasion of this study is the adoption of the final version of the Indian guidelines on CRIs, which have been surprisingly overlooked in the legal literature.<sup>2</sup> The choice of India is also justified by the fact that the country has “world class capacity in a number of scientific and technological areas including ... computing, biotechnology, Pharmaceuticals, software development”.<sup>3</sup>

The main idea is that the Internet of Things (IoT) will lead to a dramatic increase of applications for software patents<sup>4</sup> and if examiners, courts and legislators are not careful, there is a concrete risk of a surreptitious generalised grant of patents for computer programs as such (in Europe) and for abstract ideas (in the US). The clarity provided by the Indian guidelines, following a lively public debate, can constitute good practices that Europe and the US should take into account.

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<sup>1</sup> V. Choudhary, “The patentability of software under intellectual property rights: an analysis of US, European and Indian intellectual property rights” [2011] E.I.P.R. 435.

<sup>2</sup> But see P. Soni and V. Kamat, “Making sense of software” [2016] I.P.M. 28.

<sup>3</sup> Commission on Intellectual Property Rights, *Integrating Intellectual Property Rights and Development Policy: Report of the Commission on Intellectual Property Rights* (London: 2002).

<sup>4</sup> The result of a search carried out on 22 January 2017 using “Patent Scope” is that there are 5,431 patent specifications expressly referring to the Internet of Things, with China occupying the leading position, followed by the Patent Cooperation Treaty, the US, Korea, the EPO, and the UK. The peak was in 2015, with a decrease of more than half in 2016; however, this datum should not be read as a reduction in the number of IoT patents: conversely, it is probably the sign of the decline of the phrase “Internet of Things”, as a result of every “thing” becoming connected.

## Computer-implemented inventions in the case law of the European Patent Office

The protection of computer programs has always been a much debated topic—whether to protect them,<sup>5</sup> and how to protect them: through copyright, patents, or both. The European Patent Convention (EPC) excludes the patentability of computer programs claimed “as such” (art.52(2)(c) and (3) EPC). Patents are not granted merely for program listings, which are protected by copyright. If a technical problem is solved in a novel and non-obvious manner, a CII patent may be granted.

For quite a long time, it was well established that the exclusion under art.52(2)(c) and (3) EPC applied to all computer programs, independently of their contents, independently of what the program could do or perform when loaded into an appropriate computer (e.g. *Röntgeneinrichtung* and *Editable document form*<sup>6</sup>). This is no longer the case. The turning point was *Computer program product/IBM*.<sup>7</sup> The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) played a critical role in the reasoning of the Boards of Appeal. Indeed, it was observed that under art.27(1) TRIPS that “patents shall be available for any inventions, whether products or processes, in all fields of technology”. Therefore, allegedly, it would have been the clear intention of TRIPS not to exclude from patentability any inventions, and, consequently, to include computer programs, provided that they have technical character. It is still not entirely clear what this technical character is; it would seem that it is everything that goes beyond the physical modifications of the hardware consisting in causing electrical currents, since this is common to all the computer programs. It is interesting that the latter are deemed to possess a technical character even if they do not produce a direct technical effect: the potential to produce a technical effect will do.

In my humble opinion, this interpretation collides with art.10(1) TRIPS, whereby “[c]omputer programs, whether in source or object code, shall be protected as literary works under the Berne Convention”. *Ubi lex dixit voluit, ubi noluit tacuit*.

The second turning point was the opinion of the Enlarged Boards of Appeal in G3/08.<sup>8</sup> The President of the EPO referred the following point of law: “must a claimed feature cause a technical effect on a physical entity in the real world in order to contribute to the technical character of the claim?” The President noted

that according to the decisions *Colour television signal* and T190/94, a technical effect on a physical entity in the real world was required. This was, however, not the case in *Gerätsteuerung/HENZE* and *Clipboard formats I/MICROSOFT*. In these decisions the technical effects were essentially confined to the respective computer programs. According to the Enlarged Boards, *Colour television signal*<sup>9</sup> and T190/94 merely accepted the effect on a physical entity “as something sufficient for avoiding exclusion from patentability; they did not state that it was necessary”. Since *Gerätsteuerung/HENZE*<sup>10</sup> and *Clipboard formats I/MICROSOFT*<sup>11</sup> considered that there were technical effects, “whether the boards concerned considered that these technical effects were on a physical entity in the real world was irrelevant”.

Nowadays, the CIIs do not receive a stricter assessment in comparison to other inventions. Indeed, in *DNS determination of telephone number/HEWLETT-PACKARD*,<sup>12</sup> the appellant argued that, since the patent concerned a CII, the trivality test should have been stricter. According to the Board, there is no basis for doing so and

“[t]he only ‘special’ treatment for computer-implemented inventions relates to aspects or features of a non-technical nature; in fact, this treatment is only special in the sense that the presence of non-technical features is a problem which does not arise in many fields”.

“Computer program/computer program product” is one of the trickiest categories. The European Patent Office (EPO), indeed, stresses the (unclear) difference between the said category and the computer programs as a list of instructions: the subject matter is patentable

“if the computer program resulting from implementation of the corresponding method is capable of bringing about, when running on a computer or loaded into a computer, a ‘further technical effect’ going beyond the ‘normal’ physical interactions between the computer program and the computer hardware on which it is run”.<sup>13</sup>

The EPO distinguishes between two situations: on the one hand, inventions in which all the method steps can be carried out by generic data processing means; and on the other hand, inventions in which at least one method step requires the use of specific data processing means or other technical devices as essential features.<sup>14</sup>

<sup>5</sup> For instance, patenting software was considered “laughable” by S. Geard, “Software patents” (2005) ITNOW 18. See also, P. Samuelson, “Benson Revisited: The Case Against Patent Protection for Algorithms and Other Computer Program-Related Inventions” (1990) 39 Emory L.J. 1025.

<sup>6</sup> EPO Boards of Appeal, T26/86 *Röntgeneinrichtung* of 21 May 1987, EP:BA:1987:T002686.19870521; T 110/90 *Editable document form* of 15 April 1993, EP:BA:1993:T011090.19930415.

<sup>7</sup> EPO Boards of Appeal, T1173/97 *Computer program product/IBM* of 1 July 1998, EP:BA:1998:T117397.19980701.

<sup>8</sup> EPO Enlarged Boards of Appeal, G3/08 *Programs for computer* of 12 May 2010, EP:BA:2010:G000308.20100512.

<sup>9</sup> EPO Boards of Appeal, T163/85 *Colour television signal* of 14 March 1989, EP:BA:1989:T016385.19890314.

<sup>10</sup> EPO Boards of Appeal, T125/01 *Gerätsteuerung/HENZE* of 11 December 2002, EP:BA:2002:T012501.20021211.

<sup>11</sup> EPO Boards of Appeal, T424/03 *Clipboard formats I/MICROSOFT* of 23 February 2006 EP:BA:2006:T042403.20060223.

<sup>12</sup> EPO Boards of Appeal, T1606/06 *DNS determination of telephone number/HEWLETT-PACKARD* of 17 July 2007, EP:BA:2007:T160606.20070717.

<sup>13</sup> European Patent Office, *Patents for software? European law and practice* (2013), documents.epo.org/projects/babylon/eponet.nsf/0/a0be115260b5ff71c125746d004c51a5/\$FILE/patents\_for\_software\_en.pdf [Accessed 29 December 2016].

<sup>14</sup> European Patent Office, *Guidelines for Examination in the European Patent Office* November 2016), para.3.9, <http://www.epo.org/law-practice/legal-texts/html/guidelines/e/index.htm> [Accessed 29 December 2016].

Let us have a look at the first sub-category, which presents a higher risk of surreptitious software patenting. The EPO provides a non-exhaustive list which comprises examples of acceptable claim formulations.<sup>15</sup> In particular, the model of acceptable set of claims is as follows: (1) method claim; (2) apparatus/device/system claim; (3) computer program (product) claim; (4) computer-readable (storage) medium/data carrier claim.

If this pattern is followed, when assessing the novelty and inventive step of a set of claims, the examiner will start with the method claim. If the subject-matter of the method claim is considered novel and inventive, the subject-matter of the other claims will normally be novel and inventive as well. Conversely, claims that do not follow the pattern are assessed on a case-by-case basis in view of the requirements of clarity, novelty and inventive step. It is noteworthy that, as an example of the latter, the EPO provides the scenario “when the invention is realised in a distributed computing environment or involves interrelated products”, that is, to some extent, the IoT. In this event, “it may be necessary to refer to the specific features of the different entities and to define how they interact to ensure the presence of all essential features”, instead of making a mere reference to another claim as in the model set of claims.

It would seem that it could be harder to file an application for an IoT patent, in comparison with an average CII. This seems confirmed by the fact that user interaction is increasingly important in a technological (and societal) development that claims to put the user at the centre. Indeed, if user interaction is required, an objection under art.84 EPC (clear and concise definition of the matter of the claim) may arise “if it is not possible to be determine from the claim which steps are carried out by the user”.<sup>16</sup>

Final confirmation of the fact that IoT applications are less likely to be successful is the separate (and less favourable) regime afforded to inventions in which at least one method step requires the use of specific data processing means or other technical devices as essential features. The example provided is “If the invention involves an interaction between data processing steps and other technical means such as a sensor, an actuator etc.”.<sup>17</sup> Devices with sensing and actuating capabilities on the one hand, and data processing on the other hand are the main ingredients of the IoT. Now, sensors and actuators must be comprised in the independent claims if they are essential for carrying out the invention. If the claims do

not define which steps are carried out by the data processor or by the additional devices involved, as well as their interactions, objections of unclear and discursive definition (art.84 EPC) may arise.

The risk of software patents exists, but the EPO stresses that “it must be clear from the program that it is to be executed on the specific device”.<sup>18</sup> Therefore, either a clear link between the software and the hardware is shown, or the patent would hardly be granted.

The guideline on methods fully implemented by generic data processing means concludes in an obscure way. It refers to the guidance on claims comprising technical and non-technical features “[f]or the assessment of inventive step for claims comprising features related to exclusions under Art. 52(2), as is often the case with CII”. It is not clear what “is often the case” refers to. On the one hand, it cannot mean that CII often comprise features related to computer programs or methods (and other excluded subject-matter), because they always do. On the other hand, it does not seem to mean that CII usually fall under the excluded subject-matter, because the reference is to the inventiveness test. It is important to keep patentability and inventiveness separate, because even the highest degree of inventiveness must not offset the lack of patentability of computer programs as such.

A common characteristic of CII is that non-technical features play a crucial role and they may prevail over the technical features.<sup>19</sup> This has some effect on the assessment of the inventive step, which requires a non-obvious technical solution to a technical problem (*Two identities/COMVIK*; *Classification method/COMPTEL*).<sup>20</sup> An example may be a method to reduce the network traffic of a game played on the cloud by reducing the maximum number of players. This cannot form the basis for the formulation of an objective technical problem. It is rather a direct consequence of changing the rules of the game, which is inherent in the non-technical scheme.

The EPO considers that some features may be non-technical per se, but, in the context of the invention, they could “contribute to producing a technical effect serving a technical purpose, thereby contributing to the technical character of the invention”.<sup>21</sup> It remains unaffected that “features making no ... contribution [to the technical character of the invention] cannot support the presence of inventive step” (*Two identities/COMVIK*).

<sup>15</sup> European Patent Office, Guidelines for Examination in the European Patent Office November 2016), para.3.9.1, <http://www.epo.org/law-practice/legal-texts/html/guidelines/e/index.htm> [Accessed 29 December 2016].

<sup>16</sup> European Patent Office, Guidelines for Examination in the European Patent Office November 2016), para.3.9.1, <http://www.epo.org/law-practice/legal-texts/html/guidelines/e/index.htm> [Accessed 29 December 2016].

<sup>17</sup> European Patent Office, Guidelines for Examination in the European Patent Office November 2016), para.3.9.2, <http://www.epo.org/law-practice/legal-texts/html/guidelines/e/index.htm> [Accessed 29 December 2016].

<sup>18</sup> European Patent Office, Guidelines for Examination in the European Patent Office November 2016), para.3.9.2, <http://www.epo.org/law-practice/legal-texts/html/guidelines/e/index.htm> [Accessed 29 December 2016].

<sup>19</sup> European Patent Office, Guidelines for Examination in the European Patent Office November 2016), para.5.4, <http://www.epo.org/law-practice/legal-texts/html/guidelines/e/index.htm> [Accessed 29 December 2016].

<sup>20</sup> See EPO Boards of Appeal, T641/00 *Two identities/COMVIK* of 26 September 2002, EP:BA:2002:T064100.20020926; and EPO Boards of Appeal, T1784/06 *Classification method/COMPTEL* of 21 September 2012, EP:BA:2012:T178406.20120921.

<sup>21</sup> European Patent Office, Guidelines for Examination in the European Patent Office November 2016), para.5.4, <http://www.epo.org/law-practice/legal-texts/html/guidelines/e/index.htm> [Accessed 29 December 2016].

An example may be a feature which contributes only to the solution of a problem in a field excluded from patentability, such as computer programs.

This passage is critical because, even though the interrelation between software and hardware does not seem critical in the assessment of the patentability of CIIs (G3/08), it becomes important in the assessment of the inventive step, because if the claimed CII resolves a problem which regards only the software, this problem will not be regarded as technical and the patent will not be granted for lack of inventiveness. Therefore, for instance, the programmer must have had technical considerations beyond “merely” finding a computer algorithm to carry out some procedure (G3/08). Nonetheless, features of the computer program itself (*Computer program product/IBM*<sup>22</sup>) as well as the presence of a device defined in the claim (*Clipboard formats I/MICROSOFT*; *Auction method/HITACHI*<sup>23</sup>) may potentially lend technical character to the claimed subject-matter.<sup>24</sup>

From an IoT perspective, it is worth mentioning the patentability of simulations, given the growing importance of virtual reality, holographic technologies, and augmented reality. In *Checkpoint simulation/ACCENTURE*,<sup>25</sup> the Boards of Appeal pointed out that the definition of technical processes seemed not to cover simulations whose purpose is to replace physical entities with virtual ones. In T208/84, the Board had held that a technical process is different from a mathematical method in that the technical process is carried out on a physical entity and provides, as its result, a certain change in that entity. *Schaltkreissimulation I/INFINEON TECHNOLOGIES*<sup>26</sup> reversed it and held that the simulation of an adequately defined class of technical items could be a functional technical feature. In *Call center/IEX*,<sup>27</sup> finally, the Board left open the question whether it is a sufficient condition for a simulation to be patentable that the simulated items be technical. It observed that the simulated system was not technical; therefore, the condition did not hold.

The situation in Europe is still very much uncertain. In 2002, the European Commission drafted a Proposal for a Directive of the European Parliament and of the Council on the patentability of computer-implemented inventions (COM(2002) 92), which was ultimately rejected in 2005.<sup>28</sup> The main reasons for the failure were the fear of extension of the patentable subject-matter. It is what it is, but it is clear that harmonised and clear rules would benefit both businesses and consumers.

## Brief notes on software patents and the Internet of Things—some recent patent litigation in the US—Alice through the looking glass?

Mischievous commentators may argue that the CIIs are a surreptitious way to obtain a double binary for software protection. This may become true with the IoT. Indeed, with the gradual substitution of old products with smart devices, we will face an unprecedented growth of CIIs; therefore, asserting that computer programs are not patentable in Europe may sound hypocritical. In other terms, I foresee that most of the computer programs will be embedded in smart devices, with the consequential patentability of most computer programs under the label of CII.

The impact of the IoT on patents can be observed also from another point of view. I believe that the IoT provokes a redefinition of the concepts of novelty and originality for purposes of assessing patentability, essentially because of two characteristics: (1) network structure: patentability may increasingly derive from the way smart devices interact; (2) the composite nature of the said devices: novelty might stem from the way the components of a single device interact.

As to the first aspect, the customers are more and more interested in the novel interaction between their devices, rather than in the device in isolation (let us think a hub in a domotics context). Interoperability and open standards are the way forward, even though security plays often the role of an excuse to build closed sub-systems, thus giving rise to the “Internet of Silos”.

When it comes to the composite nature of devices, this means that usually devices incorporate several other devices. A smartphone contains a large number of sensors, and damage may occur because of a defect or inaccuracy of any of the said components of the device. It is not always clear whether the liability should fall on the main actor responsible for the composite device or whether its component’s actors should be liable. Generally speaking, and unless contrary evidence is provided, I am in favour of the first hypothesis, for at least two reasons.

First, the final manufacturer has a duty to double-check the security and safety of the composite device both when placing it on the market and during the provision of the services. Secondly, it could prove impossible for the customer to track the supply chain and find who was responsible for the single sub-thing. The conclusion may be different depending on the open or closed nature of the system (e.g. Apple can control third-parties’ apps through its store, whereas Android stores are open, thus not allowing the same control). Courts may also give

<sup>22</sup> EPO Boards of Appeal, T1173/97 *Computer program product/IBM* of 1 July 1998, EP:BA:1998:T117397.19980701.

<sup>23</sup> EPO Boards of Appeal, T424/03 *Clipboard formats I/MICROSOFT* of 23 February 2006, EP:BA:2006:T042403.20060223; and EPO Boards of Appeal, T258/03 *Auction method/HITACHI* of 21 April 2004, EP:BA:2004:T025803.20040421.

<sup>24</sup> European Patent Office, Guidelines for Examination in the European Patent Office November 2016), para.3.6, <http://www.epo.org/law-practice/legal-texts/html/guidelines/e/index.htm> [Accessed 29 December 2016].

<sup>25</sup> EPO Boards of Appeal T531/09 *Checkpoint simulation/ACCENTURE* of 3 May 2012, EP:BA:2012:T053109.20120503.

<sup>26</sup> EPO Boards of Appeal, T1227/05 *Schaltkreissimulation I/INFINEON TECHNOLOGIES* of 13 December 2006, EP:BA:2006:T122705.20061213.

<sup>27</sup> EPO Boards of Appeal, T1265/09 *Call center/IEX* of 24 January 2012, EP:BA:2012:T126509.20120124.

<sup>28</sup> See also J. Malgosa-Sanahujo and J. Garcia-Haro, “The directive on the patentability of computer-implemented inventions” (2004) June 42(6) IEEE Communications Magazine 28.

some relevance to the number of sub-things present in the composite thing (an aeroplane is not the same as a light bulb) and the kind of activity for which the device is used (a defibrillator can save a life and therefore higher standards of security and a stricter scrutiny are required).<sup>29</sup>

My prediction that CII cases will become more and more common has been confirmed, for instance, by the fact that Davis opens his list of top patent cases of 2016 with the “*Alice* reversals”.<sup>30</sup> These changes of direction in the relevant case law may swell the ranks of the “speculative schemers who make it their business to watch the advancing wave of improvement, and gather its foam in the form of patented monopolies” (*Atlantic Works v Brady*<sup>31</sup>).

As is common knowledge, *Alice Corp v CLS Bank International* held that a computer-implemented, electronic escrow service for facilitating financial transactions was not patentable, in that it covered only abstract ideas.

The petitioner argued that a computer “necessarily exist[s] in the physical, rather than purely conceptual, realm” (Brief for Petitioner 39). According to the US Supreme Court, however, the fact is beside the point. Indeed:

“There is no dispute that a computer is a tangible system (in §101 terms, a ‘machine’), or that many computer-implemented claims are formally addressed to patent-eligible subject matter. But if that were the end of the §101 inquiry, an applicant could claim any principle of the physical or social sciences by reciting a computer system configured to implement the relevant concept.”

If that was the case, the determination of patent eligibility would “depend simply on the draftsman’s art”,<sup>32</sup> thus sterilising the rule whereby “[I]aws of nature, natural phenomena, and abstract ideas are not patentable”.<sup>33</sup> *Alice* refers to *Mayo v Prometheus*. In *Mayo*, the Supreme Court set forth a two-step analytical framework to identify patents that, in essence, claim nothing more than abstract ideas. The court must first “determine whether the claims at issue are directed to a patent-ineligible concept”. If so, the court must then

“consider the elements of each claim both individually and ‘as an ordered combination’ to determine whether the additional elements ‘transform the nature of the claim’ into a patent-eligible application”.<sup>34</sup>

Alice had been hailed as a victory, in that it would have led to the falling down of software patents. And indeed, it was reported that in just one year from Alice “many computer-implemented and other software-related patents have been struck down”<sup>35</sup> and that the number of patent lawsuits filed had decreased by 13 per cent.<sup>36</sup> As reported by Sachs,<sup>37</sup> in October 2015 about 73 per cent of motions arguing that patents were invalid under *Alice* had been granted by federal courts. Commentators had noticed (and criticised) the “widespread proclivity of courts”<sup>38</sup> to invalidate this sort of patents. In recent times there seems to have been a change of policy.

The first example is provided by *Enfish LLC v Microsoft Corp*, which reversed a district court and concluded that all five claims on appeal were patent-eligible. The Court of Appeals observed that

“some improvements in computer-related technology when appropriately claimed are undoubtedly not abstract, such as a chip architecture, an LED display, and the like. Nor do we think that claims directed to software, as opposed to hardware, are inherently abstract”.<sup>39</sup>

Applying the *Mayo* two-step test, first one has to assess whether the claim is on a specific asserted improvement in computer capabilities or on a process that qualifies as an “abstract idea” for which computers are invoked merely as a tool. The second step asks whether nevertheless there is some inventive concept in the application of the abstract idea. Therefore, according to *Enfish*, *Alice* should not be read as broadly holding that all improvements in computer-related technology are inherently abstract, thus having to be considered at step two. In *Enfish*, consequently, *Alice* has been interpreted narrowly, thus considering patentable “a specific improvement to the way computers operate, embodied in the self-referential table”.<sup>40</sup>

Other evidence of the change of policy in the sense of a more liberal approach in recognising software patents comes from *Bascom Global Internet Services Inc v AT&T Mobility LLC*.<sup>41</sup> The US Court of Appeals for the Federal

<sup>29</sup> G. Noto La Diega, “Clouds of Things: Data Protection and Consumer Law at the Intersection of Cloud Computing and the Internet of Things in the United Kingdom” (2016) 9(1) *Journal of Law & Economic Regulation* 69.

<sup>30</sup> R. Davis, “The Top Patent Cases of 2016: Midyear Report” (6 July 2016), <http://www.law360.com/articles/812729/the-top-patent-cases-of-2016-midyear-report> [Accessed 29 December 2016].

<sup>31</sup> *Atlantic Works v Brady* 107 U.S. 192 (1883).

<sup>32</sup> *Parker v Flook* 437 U.S. 584, 593 (1978).

<sup>33</sup> *Association for Molecular Pathology v Myriad Genetics* No.12-398 (569 U.S. \_\_\_ 13 June 2013).

<sup>34</sup> *Mayo v Prometheus* 132 S. Ct at 1289, 1298 (2012).

<sup>35</sup> P. Samuelson, “Software patents falling down” (2015) 58, 11 *Communications of the ACM* 27; in April 2016, L.B. Friedman et al., “Notable Intellectual Property Cases of 2015, and a Look at 2016” (2016) 28(4) *Intellectual Property & Technology Law Journal*, 3, observed that “*Alice* continue[d] to knock out patents based on abstract ideas”.

<sup>36</sup> pwc “2015 Patent Litigation Study A change in patentee fortunes” (2015).

<sup>37</sup> R.R. Sachs, “*Alice* Haunted Federal Courts and USPTO in October” (10 November 2015), <http://www.law360.com/articles/724855> [Accessed 29 October 2016].

<sup>38</sup> M.R. Sinatra, “Do Abstract Ideas Have the Need, the Need for Speed?: An Examination of Abstract Ideas After *Alice*” (2015) 84 *Fordham L. Rev.* 821, 821.

<sup>39</sup> *Enfish LLC v. Microsoft Corp* 822 F. 3d 1327, 1335 (Fed. Cir. 2016).

<sup>40</sup> *Enfish* 822 F. 3d 1327, 1336 (Fed. Cir. 2016).

<sup>41</sup> *Bascom Global Internet Services Inc v AT&T Mobility LLC* No.15-1763 (Fed. Cir. 27 June 2016).

Circuit reversed a decision of the US District Court for the Northern District of Texas (No.3:14-cv-03942-M, Judge Barbara M.G. Lynn) by holding that Bascom Global Internet Services' patent on filtering internet content improved computer functioning and, therefore, was not an abstract idea. The broad approach builds on *DDR Holdings LLC v Hotels.com*<sup>42</sup> (Judge Raymond Chen filed both the majority opinions), whereby what matters is that an invention "is not merely the routine or conventional use of the Internet".<sup>43</sup> One has to notice that the *Enfish* claims, understood in light of their specific limitations, were unambiguously directed to an improvement in computer capabilities. Unlike *Enfish*, here the claims and their specific limitations "do not readily lend themselves to a step-one finding that they are directed to a nonabstract idea".<sup>44</sup> Therefore, the court deferred its consideration of the specific claim limitations' narrowing effect for step two, which means assessing the inventive concept. Allegedly, the District Court has ignored that

"[t]he inventive concept inquiry requires more than recognizing that each claim element, by itself, was known in the art. As is the case here, an inventive concept can be found in the non-conventional and non-generic arrangement of known, conventional pieces".<sup>45</sup>

Finally, it is interesting that the concurring opinion tends towards an even more relaxed approach to software patents. Indeed, Judge Newman urges

"a more flexible approach to the determination of patent eligibility, for the two-step protocol for ascertaining whether a patent is for an 'abstract idea' is not always necessary to resolve patent disputes".<sup>46</sup>

If the stream inaugurated with *DDR* and confirmed by *Enfish* and *Bascom* were to lead to the development of future case law, there is a concrete risk that patents would be granted for every software and method, with the sole exclusion of "longstanding, well-known method[s] of organizing human behavior".<sup>47</sup>

If one analyses the relevant decisions of September, October and November 2016, the aftermath does not provide evidence for a clear prediction. Indeed, on the one hand, *Fairwarning IP LLC v Iatric Sys Inc*,<sup>48</sup> *Affinity*

*Labs LLC v Amazon.Com Inc*,<sup>49</sup> *Affinity Labs of Texas LLC v DirecTV LLC*,<sup>50</sup> *Synopsis Inc v Mentor Graphics Corp*,<sup>51</sup> and *Intellectual Ventures I LLC v Symantec Corp*<sup>52</sup> conclude with patent-ineligible subject-matter.

On the other hand, leveraging the above analysed recent case law, *McRO Inc, DBA Planet Blue v Bandai Namco Games America Inc*<sup>53</sup> concluded that "the ordered combination of claimed steps, using unconventional rules that relate sub-sequences of phonemes, timings, and morph weight sets, is not directed to an abstract idea is patent-eligible". Likewise, in *Amdocs (Israel) Ltd v Openet Telecom Inc*,<sup>54</sup> the Federal Circuit found that the claims at issue could be patentable in light of their written descriptions. Thus, it reversed the District Court's decision whereby the claims were directed to the abstract ideas of "correlating two network accounting records to enhance the first record"<sup>55</sup> and "using a database to compile and report on network usage information".<sup>56</sup> In this case, the Court of Appeals held that even if they were to agree that the claims were directed to ineligible abstract ideas under step one of the *Mayo* test, nonetheless they would be eligible under step two because they allegedly contain a sufficient "inventive concept" (this does not mean, however, that they are valid).<sup>57</sup> It is noteworthy that Circuit Judge Reyna dissented and criticised the majority for "avoid[ing] determining whether the asserted claims are directed to an abstract idea, or even identifying what the underlying abstract idea is". I join the dissenting opinion also, inasmuch as, even though it accepts that the written description discloses a patentable network monitoring system, it stressed that "the inquiry is not whether the specifications disclose a patent-eligible system, but whether the claims are directed to a patent ineligible concept". There would seem to be a contrast with the case law that clarifies that the "§ 101 inquiry must focus on the language of the Asserted Claims themselves ... complex details from the specification cannot save a claim directed to an abstract idea that recites generic computer parts".<sup>58</sup>

There is the risk of a gradual departure from *Alice* and *Mayo*, up to the point of patenting abstract ideas with no proper inventive concept. Soon, we might leave Wonderland and *Alice* may be looked at only through the looking glass. I join the concurring opinion of Judge Mayer in *Intellectual Ventures* (considered the "big event"

<sup>42</sup> *DDR Holdings LLC v Hotels.com LP* 773 F. 3d 1245 (Fed. Cir. 2014).

<sup>43</sup> *DDR* 773 F. 3d 1245, 1259 (Fed. Cir. 2014).

<sup>44</sup> *Bascom* No.15-1763 (Fed. Cir. 27 June 2016) at 13.

<sup>45</sup> *Bascom* No.15-1763 (Fed. Cir. 27 June 2016) at 15.

<sup>46</sup> *Bascom* No.15-1763 (Fed. Cir. 27 June 2016) at 2.

<sup>47</sup> *Bascom* No.15-1763 (Fed. Cir. 27 June 2016) at 12.

<sup>48</sup> *Fairwarning IP LLC v Iatric Sys Inc* No.15-1985 (Fed. Cir. 2016).

<sup>49</sup> *Affinity Labs, LLC v Amazon.Com Inc* No.6:2015cv00029 - Document 75 (W.D. Tex. 2016).

<sup>50</sup> *Affinity Labs of Texas LLC v DirecTV LLC* No.2015-1845, 2016 WL 5335501 (Fed. Cir. 23 September 2016).

<sup>51</sup> *Synopsis Inc v Mentor Graphics Corp* No.2015-1599 (Fed. Cir. 2016).

<sup>52</sup> *Intellectual Ventures I LLC v Symantec Corp* No. 15-1769 (Fed. Cir. 2016).

<sup>53</sup> *McRO Inc, DBA Planet Blue v Bandai Namco Games America Inc* No.15-1080 (Fed. Cir. 2016)

<sup>54</sup> *Amdocs (Israel) Ltd v Openet Telecom Inc* 56 F. Supp. 3d 813 (E.D. Va. 2014).

<sup>55</sup> *Amdocs* 56 F. Supp. 3d 813, 820 (E.D. Va. 2014).

<sup>56</sup> *Amdocs* 56 F. Supp. 3d 813, 823 (E.D. Va. 2014).

<sup>57</sup> See also, more recently, *Trading Technologies Intl v CQG, Inc.*, No. 16-1616 (Fed. Cir. 2017).

<sup>58</sup> *Synopsis v Mentor Graphics Corp* (Fed. Cir. 2016) at 20–21, citing *Accenture Global Servs GmbH v Guidewire Software Inc* 728 F.3d 1336, 1345 (Fed. Cir. 2013).

of the case by Crouch<sup>59</sup>), whereby claims directed to software implemented on a generic computer are categorically not eligible for patent. In particular,

“the claims at issue in *BASCOM*, *Enfish*, and *DDR*, like those found patent ineligible in *Alice*, do ‘no more than require a generic computer to perform generic computer functions’ *Alice*, 134 S. Ct. at 2539. Eliminating generally-implemented software patents would clear the patent thicket, ensuring that patent protection promotes, rather than impedes, ‘the onward march of science’ (*O’Reilly v Morse*, 56 U.S. (15 How.) 62, 113 (1853), and allowing technological innovation to proceed apace”.

Roberts has commented that now, given this concurring opinion, “software patents are in peril”.<sup>60</sup> It is not causal that the other point of Judge Mayer’s opinion was that “patents constricting the essential channels of online communication run afoul of the First Amendment”. Indeed, a holistic approach to patents should take into account a number of trade-offs and endeavour to strike a balance between the conflicting interests, such as the right of the applicant to government-sanctioned monopolies, on the one hand, and, on the other hand, the “right to receive information and ideas [which] regardless of their social worth, is fundamental to our free society”.<sup>61</sup> A similar approach, unprecedented in US law according to Crouch, is already part of the European tradition, as one can see, for instance, in *GS Media BV v Sanoma Media Netherlands BV*,<sup>62</sup> even though sometimes the result of the balance favours private interests, as pointed out by Nivarra.<sup>63</sup> Indeed, on 8 September 2016, the Court of Justice, in proposing a liberal approach to hyperlinking, stressed that

“the harmonisation effected by it is to maintain, in particular in the electronic environment, a fair balance between, on one hand, the interests of copyright holders and related rights in protecting their intellectual property rights, safeguarded by Article 17(2) of the Charter of Fundamental Rights of the European Union (‘the Charter’) and, on the other, the protection of the interests and fundamental rights of users of protected objects, in particular their freedom of expression and of information, safeguarded by Article 11 of the Charter, and of the general interest”.<sup>64</sup>

Finally, news from the world of quantified self and activity tracking confirm that CII litigation is increasing in relation to the growth of the IoT. An example is

provided by *Jawbone v Fitbit*. The companies involved are giants in the market of quantified self and wearables. On 28 April 2016, two of the Jawbone patents that were disputed at the US International Trade Commission (ITC) were invalidated. Since Jawbone was trying to leverage those patents to prevent Fitbit’s imports in the US, this result appears hardly achievable. However, a Jawbone representative pointed out that the patent ruling will be appealed and that “the two patents that are the subject of the ITC ruling represent only a portion of Jawbone’s case against Fitbit and a small subset of Jawbone’s overall patent portfolio” (Goode, 2016).<sup>65</sup> Nonetheless, on 23 August 2016, Judge Dee Lord of the ITC struck down Jawbone’s request for an import ban against Fitbit products “the competitors’ cross-filings for patent infringements had all been invalidated”.<sup>66</sup>

What is interesting from our perspective is the official court filing states that the claims on the relevant patents “seek a monopoly on the abstract ideas of collecting and monitoring sleep and other health-related data”. Consequently, they are not eligible for the grant of a patent, also because, according to the filing,

“no innovating concept is claimed in either patent. With particular regard to systems for organizing human activity, the courts have determined that a patent is not eligible when it claims the use of computer technology to accomplish tasks that were in the past performed by human beings”.

This ruling takes a strict approach to CIIs, which is commendable, since we foresee that an increasing number of applications for patents on IoT-software will be filed. The ruling has also an impact on the world of artificial intelligence and artificial enhancement. These technologies are progressively substituting for human beings in their everyday tasks. Inventors and developers should be aware that, generally speaking, there will be a tendency not to award patents for inventions enabling machines to accomplish tasks once performed by human beings.

### **Guidelines on the examination of computer-related inventions—historical background, basic concepts and the (not always savvy) protests of the civil society**

It is not sufficiently known that India has a pioneering role in the development of new technologies and new approaches to the concept itself of innovation.

<sup>59</sup> D. Crouch, “First Amendment Finally Reaches Patent Law” (2 October 2016), <http://patentlyo.com/patent/2016/10/amendment-finally-reaches.html> [Accessed 2 January 2017].

<sup>60</sup> J.J. Roberts, “Here’s Why Software Patents Are in Peril After the Intellectual Ventures Ruling” (3 October 2016), <http://fortune.com/2016/10/03/software-patents/> [Accessed 2 January 2017].

<sup>61</sup> *Stanley v Georgia* 394 U.S. 557, 564 (1969).

<sup>62</sup> *GS Media BV v Sanoma Media Netherlands BV* (C-160/15) EU:C:2016:644; [2016] Bus. L.R. 1231.

<sup>63</sup> L. Nivarra, “La proprietà europea tra controriforma e ‘rivoluzione passiva’” (2011) 13(3) *Europa e diritto Privato* 575.

<sup>64</sup> *GS Media* EU:C:2016:644; [2016] Bus. L.R. 1231 at [31].

<sup>65</sup> L. Goode, “Fitbit wins big in trade ruling vs. Jawbone” (29 April 2016), *The Verge*, <http://www.theverge.com/2016/4/29/11538454/fitbit-wins-trade-patent-ruling-vs-jawbone-ineligible> [Accessed 2 January 2017].

<sup>66</sup> Trade Secrets Institute (2016). “In the Matter of Certain Activity Tracking Devices” (20116), 337-963, US International Trade Commission (Washington), <http://tsi.brooklaw.edu/cases/matter-certain-activity-tracking-devices-337-963-us-international-trade-commission-washington> [Accessed 2 January 2017].

A notable example is the Ministry of Electronics & Information Technology's "Draft Policy on Internet of Things" (2015) (2015),<sup>67</sup> which builds on the Digital India Programme. In issuing it, the Department of Electronics and Information Technology (DeitY) pursued four goals: first, to create an IoT industry in India of US\$15 billion by 2020 (with a share of 5–6 per cent of the global IoT industry); secondly, to undertake capacity development for IoT specific skill-sets for domestic and international markets; thirdly, to undertake R & D for all the assisting technologies; and lastly, to develop smart devices specific to Indian needs in all possible domains. The policy has been seen by Aggarwal (2015)<sup>68</sup> as the realisation of the "zero defect zero effect" slogan, which was coined by the Prime Minister of India, Narendra Modi. Part of the Make in India strategy, it denotes manufacturing mechanisms whereby the possibility of error and the environmental impact are, or should be, eliminated. Malevolent commentators may judge it as a "green washing" policy in order to convince transnational corporations to manufacture their products in India and to increase the exportations. In fact, in his Independence Day speech, Modi had said that the "zero defect, zero effect" policy was critical so that "our exported goods are never returned to us".<sup>69</sup> However, the reasons for the policy will prove to be of secondary importance, as long as the implementation activities will be carried out with the bottom-up inclusive approach that we are seeing in the deployment of the Indian smart cities plan, as in the Ministry of Urban Development's Ministry of Urban Development, "Smart cities: Statement and Guidelines" (2015).

Future research will focus on the risks of such a fast growth. For instance, in 2010, the Government of India (better said, the Unique Identification Authority of India, UIDAI) started collecting biometric data (mainly fingerprints and iris signatures) as a condition to issue the so-called Aadhaar number and card. Without the number, one cannot apply for subsidies. The UIDAI has already collected the biometric data of nearly a billion people.<sup>70</sup> On 25 March 2016, the Aadhaar (Targeted Delivery of Financial and Other Subsidies, Benefits and Services) Act 2016 has received the assent of the President. The Act provides federal agencies with the

right to access the said database in the interest of national security. There is an actual risk of using the largest biometric database in the world for surveillance purposes.

India, unlike the US, is following the double-binary European approach. Indeed, on the one hand, computer programs are literary works under s.2(o) of the Indian Copyright Act 1957 (see also s.14(b)). On the other hand, s.3(k) of the Patents Act 1970 states that a "computer programme *per se*" is not patentable, but until recently it was not clear whether CRIs were excluded from the subject-matter or not, even though the negative option seemed to prevail.<sup>71</sup> The lacuna in the Patents Act when it comes to CRIs will not surprise anyone who knows that this Act, notwithstanding its amendments, remains an old Act, as shown *inter alia* by the several provisions on floppy disks.

The path towards the introduction of software patents had been gradual and Brownian. In 2002, the Patents (Amendments) Act 2002 introduced the words "per se" in s.3(k) of the Patents Act. The phrase "per se" was not present in the Patents (Second Amendment) Bill 1999,<sup>72</sup> but they have been added following the Joint Parliamentary Committee's recommendation. Indeed, it was noted that

"sometimes the computer program may include certain other things, ancillary thereto or developed thereon. The intention here is not to reject them for grant of patent if they are inventions. However, the computer programs as such are not intended to be granted patent".<sup>73</sup>

The first guidance explained "ancillary" by referring to "things which are essential to give effect to the computer program".

The second step was the Patents (Amendment) Ordinance 2004. At that time, an amendment to provide for the patentability of computer programs insofar as they enhanced technology was rejected by the Lok Sabha and the Rajya Sabha (the houses of the Parliament of India), "as they feared that this would be beneficial only to multinational companies".<sup>74</sup>

<sup>67</sup> Ministry of Electronics & Information Technology, "Draft Policy on Internet of Things" (2015), [https://mygov.in/sites/default/files/master\\_image/Revised-Draft-IoT-Policy-2.pdf](https://mygov.in/sites/default/files/master_image/Revised-Draft-IoT-Policy-2.pdf) [Accessed 2 January 2017].

<sup>68</sup> V. Aggarwal, "India's first Internet of Things policy to focus on Zero Defect, Zero Effect" (10 April 2015), *Economic Times India*, [articles.economictimes.indiatimes.com/2015-04-10/news/61017670\\_1\\_1-iot-m-sips-draft-policy](http://articles.economictimes.indiatimes.com/2015-04-10/news/61017670_1_1-iot-m-sips-draft-policy) [Accessed 2 January 2017].

<sup>69</sup> N. Modi, "Prime Minister Narendra Modi's speech on 68th Independence Day" (15 August 2016), <http://indianexpress.com/article/india/india-news-india/pm-narendra-modis-speech-on-independence-day-2016-here-is-the-full-text/> [Accessed 2 January 2017].

<sup>70</sup> S. Miglani and M. Kumar, "India's billion-member biometric database raises privacy fears" (16 March 2016), <http://www.reuters.com/article/us-india-biometrics-idUSKCN0W114E> [Accessed 2 January 2017].

<sup>71</sup> See A. Banavar, "Patenting of Computer Related Inventions: A Look at Bilsky 1 and its Applicability in the Indian Scenario" (2010) 5 J. Int'l Com. L. & Tech. 90, 96; and S. Basheer, "A method to the madness" (5 November 2008), *Live Mint*, <http://www.livemint.com/Opinion/LQYh5iUHJzpqQ5oBRmSxUXP/A-method-to-the-madness.html> [Accessed 2 January 2017].

<sup>72</sup> Banavar, "Patenting of Computer Related Inventions" (2010) 5 J. Int'l Com. L. & Tech. 90, 96.

<sup>73</sup> Comments and recommendations on the Guidelines for Examination of Computer-Related Inventions (CRIs) (2015), <http://www.knowledgecommons.in/wp-content/uploads/2015/11/Comments-Recommendations-on-CRI-Guidelines-2015.pdf> [Accessed 2 January 2017].

<sup>74</sup> S. Chaturvedula, "Revised guidelines for software patents put on hold" (17 December 2015), *Live Mint*, <http://www.livemint.com/Industry/XGBBgNlImvuEUhJW52cWgK/Revised-guidelines-for-software-patents-put-on-hold.html> [Accessed 2 January 2017].

A similar failed attempt was made by the Patents (Amendment) Bill 2005, which sought to extend patentability to computer programs with “technical application to industry”. The “transnational corporations” exception was successfully raised again.<sup>75</sup>

In 2011, then, the Controller General of Patents, Designs and Trade Marks (the Controller, the Indian equivalent of the Intellectual Property Office) clarified that “claims directed at ‘computer program products’ are computer programs per se stored in a computer readable medium and as such are not allowable”.<sup>76</sup> Moreover, when a claim inter alia contains subject-matter that is not limited to a computer program, “it is examined whether such subject matter is sufficiently disclosed in the specification and forms an essential part of the invention”.

It is notable that the draft CRI guidelines published in 2013 were clear as to the exclusion of any computer program that may work on any general-purpose computer or “related device” (mainly smart devices) did not meet the requirements of law (drawing the attention of the legal scholarship<sup>77</sup>).

In August 2015, the Controller issued the first CRI guidance; it allowed the patenting of programs which demonstrated technical advancement. Unsurprisingly, the guidance gave rise to protests from the civil society and attention from the legal scholarship.<sup>78</sup> Many organisations and citizens, indeed, complained about the contrast with s.3(k) of the Patents Act and because software patentability was seen as a break with innovation.<sup>79</sup> To be precise, the guidance reaffirmed that computer programs per se were excluded from patentability and, therefore, “[c]laims which are directed towards computer programs per se are excluded from patentability”; consequently, the citizens’ claims that computer programs were excluded “unconditionally” and that the one at issue was a “blanket exclusion” were not entirely correct. Moreover, for being considered patentable, the subject-matter should involve

“a novel hardware, or a novel hardware with a novel computer program, or a *novel computer program with a known hardware* which goes beyond the normal interaction with such hardware and affects a change in the functionality and/or performance of the existing hardware”.

The “physical” element looked critical, but the third category presented some ambiguity. In addition, the attached clarification was not helpful (also, it was not clear if it was a clarification or a fourth category): a computer program,

“when running on or loaded into a computer, going beyond the ‘normal’ physical interactions between the software and the hardware on which it is run, and is *capable of bringing further technical effect may not be considered as exclusion under these provisions*”.<sup>80</sup>

The letter of the civil society complained that the patentability of software was maintained dependent on the industrial applicability. This is not precise. Whereas the cited patentability as a result of technical effect could be tricky, the guidance limited itself to state that:

“The examination procedure of patent applications relating to CRIs is the same as that for other inventions to the extent of consideration of novelty, inventive step, industrial applicability, sufficiency of disclosure and other requirements under the Patents Act and the rules made thereunder.”

After the said protests, with Order No.70 of 2015, the Controller announced that the criticised guidance was to be “kept in abeyance till discussions with stakeholders are completed and contentious issues are resolved”. The suspension led to further confusion.<sup>81</sup> The discussions were completed and the contentious issues resolved on 19 February 2016, when the Controller published the new guidelines on the examination of CRIs.<sup>82</sup>

CRIs now comprise

“inventions which involve the use of computers, computer networks or other programmable apparatus and include such inventions having one or more features of which are realized wholly or partially by means of a computer program or programs”.

Incidentally, one may note that “other programmable apparatus” is a flexible concept indeed capable to encompass smart devices. The pendant of this notion is the “computer system”, which, under the Information Technology Act 2000, is

“a device or collection of devices, including input and output support devices and excluding calculators which are not programmable and capable of being used in conjunction with external files, which

<sup>75</sup> According to M. Eberhardt et al., “The heterogeneous effect of software patents on expected returns: Evidence from India”, 145 (2016) *Economics Letters* 73–78, 74, even though the attempt of the Government failed, the announcement itself “of a loosening of the restrictions on patentability, on average, resulted in significant positive stock market returns for affected companies”.

<sup>76</sup> Office of Controller General of Patents, Designs & Trademarks, “Manual of Patent Office Practice and Procedure” (2011), 08.03.05.10.

<sup>77</sup> R. Acharya and D. Nagarajan, “India: patents — Indian Patent Office guidance for examining computer related inventions” (2013) 27(12) *W.I.P.R.* 8; and S. Banerjee, “Indian Patent Office issues draft guidelines on examination of computer implemented inventions” (2013) 8(10) *J.I.P.L.P.* 744.

<sup>78</sup> See M. Singh, “India: patents — new guidelines from the Patent Office — software alone isn’t Patentable” (2016) 30(3) *W.I.P.R.* 15; S. Attri, “Indian Patent Office publishes computer related inventions guidelines” (2016) 11(3) *J.I.P.L.P.* 154; M. Singh, “India: patents — Indian Patent Office publishes new computer inventions guidelines” (2015) 29(10) *W.I.P.R.* 12.

<sup>79</sup> *Concerns over the “Guidelines for Examination of Computer Related Inventions (CRIs)”* (15 September 2015), [sflc.in/wp-content/uploads/2015/09/Letter\\_CRIGuidelines2015-Prime-Minister.pdf](http://sflc.in/wp-content/uploads/2015/09/Letter_CRIGuidelines2015-Prime-Minister.pdf) [Accessed 2 January 2017].

<sup>80</sup> Office of Controller, *Draft Guidelines for Examination of Computer Related Inventions* (June 2013).

<sup>81</sup> K. Vadehra and S. Vadehra, “Confusion reigns over patenting of computer programs” (2016) 257 *M.I.P.* 98.

<sup>82</sup> Office of the Controller, “Guidelines for Examination of Computer Related Inventions (CRIs)” (2016).

contain computer programs, electronic instructions, input data and output data, that performs logic, arithmetic, data storage and retrieval, communication control and other functions.”

This is a veritable “IoT” dictionary. Even before that, the definition of “computer” is sufficiently flexible to accommodate the IoT specific characteristics. The term “computer” is defined in the Information Technology Act, 2000 as

“any electronic, magnetic, optical or other high-speed data processing device or system which performs logical, arithmetic, and memory functions by manipulations of electronic, magnetic or optical impulses, and includes all input, output, processing, storage, computer software, or communication facilities which are connected or related to the computer in a computer system or computer network”.

The new guidelines reaffirm the exclusion of the software patents and introduce a three-step test to determine the applicability of s.3(k) of the Patents Act to CRIs. Indeed:

“Examiners may rely on the following three stage test in examining CRI applications: (1) Properly construe the claim and identify the actual contribution; (2) If the contribution lies only in mathematical method, business method or algorithm, deny the claim; (3) *If the contribution lies in the field of computer program, check whether it is claimed in conjunction with a novel hardware* and proceed to other steps to determine patentability with respect to the invention.”<sup>83</sup>

Therefore, if the hardware is not novel (e.g. some innovative smart device), then no patent will be granted. It would seem, consequently, that computer programs running on traditional computers should be excluded by the subject-matter of patents. This is particularly clear if one reads the previous version of the guidelines, which included the eligibility of

“a novel computer programme with a known hardware which goes beyond the normal interaction with such hardware and affects a change in the functionality and/or performance of the existing hardware”.

Moreover, even though the phases of the examination procedure of CRIs are the same as the other inventions as to novelty, inventive step, industrial applicability and sufficiency of disclosure, “[t]he determination that the subject matter relates to one of the excluded categories requires greater skill on the part of the examiner”. While explaining that these concepts apply equally to ordinary

inventions and to CRIs, the Controller specifies that the “determination of industrial applicability in case of CRIs is very crucial since applications relating to CRIs may contain only abstract theories, lacking in industrial application”. Furthermore, it explains how the sufficiency of disclosure applies to CRIs. The said requirement means that the invention has to be described “fully and particularly” (“what”) and the specification has to explain the best method of operation. Under para.4.4.2 of the new guidance,

“[t]he best mode of operation and/or use of the invention shall be described with suitable illustrations. The specification should not limit the description of the invention only to its functionality rather it should specifically and clearly describe the implementation of the invention”.

Even though the use of “may” might suggest a certain scope for the examiners’ discretion and one would have expected that the excluded subject-matter should have to be interpreted in a stricter way (as opposed to require “greater skill”), the wording is adamant in linking the patentability of CRIs to inventions which constitute an inextricable mixture of software and (novel) hardware; that is to say, to smart devices. From this point of view, the new CRI guidance may be a formidable input to the developments of IoT inventions, now supported by legal clarity and certainty.

The system is completed by the *Manual of Patent Office Practice and Procedure* (adopted in 2011 after a long debate over drafts of 2005 and 2008), which contributes to the overall certainty of the relevant legal framework. It imposes, as a first step, to examine whether the subject-matter of an application falls under the categories of mathematical or business method and algorithms. These are always excluded from the patentability, not only *per se*. This is important given the growing relevance of artificial intelligence algorithms in many technological domains, from the IoT to virtual reality and predictive analytics. In no instance will they be eligible for patent protection. If the subject-matter concerns a computer program and this is not claimed as such, the examiner has to assess whether it is a computer program product. In this case, indeed, the grant of a patent is “as such ... not allowable”.<sup>84</sup> Finally, if the claims contain also a subject matter which is not a computer program, it is examined “whether such subject matter is sufficiently disclosed in the specification and forms an essential part of the invention”.<sup>85</sup>

It has been argued that, India’s software industry being allegedly in its initial phase, “there is perhaps a need for allowing the patentability of software”<sup>86</sup>; according to Choudhary, India is “a leading software hub in the world”.<sup>87</sup> I beg to differ. I believe that the joint operation

<sup>83</sup> Office of the Controller, “Guidelines for Examination of Computer Related Inventions (CRIs)” (2016), s.5.

<sup>84</sup> *Manual of Patent Office Practice and Procedure* (2011), 08.03.05.10, f.

<sup>85</sup> *Manual of Patent Office Practice and Procedure* (2011), 08.03.05.10, e.

<sup>86</sup> Banavar, “Patenting of Computer Related Inventions” (2010) 5 J. Int’l Com. L. & Tech. 90, 98.

<sup>87</sup> V. Choudhary, “The patentability of software under intellectual property rights: an analysis of US, European and Indian intellectual property rights” [2011] E.I.P.R. 435, 446.

of copyright on computer programs and patents on CRIs provides already an adequate protection and a strengthening of the regime could stifle innovation in the IoT and in other technological domains.

Five years ago, Choudhary<sup>88</sup> complained that the protection of software patents was weak because India did not have a well-laid-out practice to guide the Indian Patent Office, which, therefore, was reportedly “quite incapable of evaluating complicated and technically trivial claims which software patents often present”. I believe that the new Guidelines on the Examination of CRIs and the *Manual of Practice* have helped India overcome the hurdle.

## Conclusions

With the advent of the IoT, applications for software patents disguised as CIIs will increase substantially in Europe. A similar phenomenon will take place in the US, where there is the risk of a departure from *Alice*, with subsequent patentability of mere abstract ideas without proper inventive concept.

The traditional view is that the US Patent and Trademark Office undertakes less rigorous patent examination than the EPO.<sup>89</sup> I do not know if the contrary has become true, as a recent study claims.<sup>90</sup> However, in the field of CIIs it seems to me that both the systems are prone to recognising a wide protection with subsequent increased propertisation of knowledge. It may be not useless to remember that intellectual property is about striking a balance between a number of (sometimes conflicting) private and public interests. A too strong patent regime for computer programs, at a moment when software is being embedded in most traditional devices, risks not taking into account the trade-off between remuneration of the investments and public good. Moreover, the prevalence of proprietary models can jeopardise interoperability, which is at the very heart of the IoT. Furthermore, there are issues of competition law. It has been noted that since IoT manufacturers will run to get patents “[n]ational regulators must ... apply utmost prudence to ensure that grants do not act as barriers to new entrants in existing and emerging markets”.<sup>91</sup> From a consumer law perspective, there is the

“risk that intellectual property arguments and digital rights management will extend to products and services containing software, and risk superseding consumer protection law”.<sup>92</sup>

But regimes such as product liability, unfair terms and unfair commercial practices can prevail over contracts and licences, thus preventing intellectual property abuses.

There are some good practices to be followed. For instance, on 28 October 2016 a new exemption to the Digital Millennium Copyright Act came into force allowing the circumvention of DRM and the reverse engineering of consumer devices for security purposes. Being eventually legal to hack one’s own devices, it would seem that consumers may be (relatively) back in control of their devices, notwithstanding the intellectual property protections.<sup>93</sup>

Another approach that should be followed is the Indian one. After the civil society had (maybe too) harshly criticised the first version of the guidelines on the CRIs, the Government revised them in order to make clear that in no way would CRIs be a surreptitious way of granting software patents. Moreover, as a policy recommendation and in consideration of the foreseen growth of CIIs due to the IoT, the European Patent Office may want to be inspired by the Indian guidelines to update and deepen its out-of-date and insufficiently thorough guidance. A first commendable step has been the publication of the 8th edition of *Case Law of the Boards of Appeal of the European Patent Office* in July 2016, but some ad hoc guidelines would be more appropriate. Furthermore, it is commendable that India clearly distinguishes between computer programs and algorithms (the latter being non-patentable, even if they were not per se). Finally, the pressing issue of computer program products is tackled by excluding them from protection altogether.

Probably, a clear exclusion of the patentability of computer programs as such is the best compromise one could reach in this historical moment. Indeed, absolute exclusions like the one of Madde 6 of the 551 sayili Patent Haklarinin Korunmasi Hakkinda Kanun Hükmünde Kararname seem definitely recessive in the genetics of patents. There is evidence that the world is moving towards a wider and stronger protection for computer programs. One could mention, for instance, China. On 28 October 2016, indeed, the State Intellectual Property Office of the People’s Republic of China launched a public consultation on the revised Guidelines for Patent Examination. As to the examination criteria concerning computer programs, it is proposed to replace “computer

<sup>88</sup> Choudhary, “The patentability of software under intellectual property rights.” [2011] E.I.P.R. 435, 446.

<sup>89</sup> According to R.H. Stern, “Micro Law – Software Patents” (1990) 10(2) IEEE Micro 8, the “Patent and Trademark Office seems to be willing to issue virtually any software patent presented to it, and it lacks facilities to search out the prior art in the field”. See more recently A. Nightingale, “More Rigorous Patent Examination in US Than Europe and Australia?”, *Intellectual Property Watch*, 2 November 2016.

<sup>90</sup> A.F. Christie, C. Dent and J. Liddicoat, “The Examination Effect: A Comparison of the Outcome of Patent Examination in the US, Europe and Australia” (2016) 16 J. Marshall Rev. Intell. Prop. L. 21.

<sup>91</sup> Consumers International, “Connection and Protection in the Digital Age: The Internet of Things and challenges for consumer protection” (April 2016), p.78, <http://www.consumersinternational.org/media/1657273/connection-and-protection-the-internet-of-things-and-challenges-for-consumer-protection.pdf> [Accessed 2 January 2017].

<sup>92</sup> Consumers International, “Connection and Protection in the Digital Age: The Internet of Things and challenges for consumer protection” (April 2016), p.5, <http://www.consumersinternational.org/media/1657273/connection-and-protection-the-internet-of-things-and-challenges-for-consumer-protection.pdf> [Accessed 2 January 2017].

<sup>93</sup> A. Greenberg, “It’s Finally Legal to Hack Your Own Devices (Even Your Car)” (31 October 2016), *Wired*, [https://www.wired.com/2016/10/hacking-car-pacemaker-toaster-just-became-legal/?mbid=nl\\_11116\\_p3&CNDID=32599349](https://www.wired.com/2016/10/hacking-car-pacemaker-toaster-just-became-legal/?mbid=nl_11116_p3&CNDID=32599349) [Accessed 2 January 2017].

programs” with “computer programs per se”.<sup>94</sup> This divergence is particularly interesting, given the comparable socio-economic situations in India and China. In a very comprehensive report of nearly 15 years ago, it had been noticed that:

“Policies required in countries with a relatively advanced technological capability where most poor people happen to live, for instance India or China, may well differ from those in other countries with a weak capability, such as many countries in sub-Saharan Africa.”<sup>95</sup>

Future research will shed light on the reasons for the said divergence.

It is not entirely clear if the US and Europe are moving towards the patentability of abstract ideas and computer programs per se, respectively. The above analysis has

sent mixed signals: we are indeed still into a “morass”.<sup>96</sup> One should only wish that legislators and regulators were aware of the indeed negative consequences of software patents becoming commonplace in an IoT world. At the end of the day, one should remember that it “was never the object of those laws to grant a monopoly for every trifling device, every shadow of a shade of an idea” (*Atlantic Works v Brady*<sup>97</sup>). The sea of patent software looks very stormy in US, where, after *Alice*’s reversals, there seems to be the risk of swelling the ranks of the “speculative schemers who make it their business to watch the advancing wave of improvement, and gather its foam in the form of patented monopolies”.<sup>98</sup> Some good news, however, comes from Judge Mayer’s dissenting opinion in *Intellectual Ventures* that innovatively brings free speech into the reasoning on patents.

<sup>94</sup> Public Consultation on the Revised Guidelines for Patent Examination, Pt II, Ch.9, s.2 of the Guidelines. See Li, “Chinese Patent Office Proposed Revision to its Examination Guidelines” (16 November 2016), <http://trust-in-ip.com/chinese-patent-office-proposed-revisions-to-its-examination-guidelines> [Accessed 2 January 2017].

<sup>95</sup> Commission on Intellectual Property Rights, *Integrating Intellectual Property Rights and Development Policy* (2002).

<sup>96</sup> B.P. Gleason, “Don’t give up section 101, don’t ever give up” 65 (2015) Cath. UL Rev., 773.

<sup>97</sup> *Atlantic Works v Brady*, 107 U.S. 192 (1883).

<sup>98</sup> *Atlantic Works v Brady*, 107 U.S. 192 (1883).