Grasping the “Invention” in the Digital World. “Technical Effect and Technical Character” in a Technologically Neutral (?) Patent System

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Technological neutrality is a principle very often referred to in the field of Intellectual Property Rights (IPRs). Although it has adopted a somewhat different meaning depending on the IPR it has been related to, it has been promoted as an objective[1]. In general, technological neutrality stands for the ability of legal rules to apply independently of technologies, something that seems to be a sine qua non for the survival of law over time. While legal rules that endure technological change and can adapt to a different technological reality is appealing, it seems that rapid technological developments put a certain pressure on the structure and applicability of legislative acts.

Intellectual Property (IP) law is a typical area of law where technology is important and where the law in itself has been the result of the challenges of technological developments. Being able to adapt (or better said interpreted and applied) the law taking into consideration the needs, possibilities but also challenges and difficulties technological development brings, has been necessary for the evolution of the IP system. Naturally, the evolution of technology influences the way we use products, the services that become available, the way we share information. Technology changes our everyday life, but also forces us to face dilemmas and challenges we did not expect. Technology is today a central ingredient in our social, political, economic and cultural life, then laws that respond to (or that in fact fail to respond to) technological change have/will have an impact on general societal values but also on the way the law is formed, applied and interpreted[2].

This adaptability has been equally important with regards to the definition of what constitutes protectable subject-matter as well as with regards to determining whether certain uses fall under the scope of exempted uses or simply constitute infringement. Consequently, what becomes thus appealing is to see whether the evolution of technological terminology has an impact (and to what extent) on the definition of legal terminology and on the broader interpretation and application of legal provisions.

In the field of digital information technology, technological advancements have revolutionised the applications of advanced computer software, that nowadays stand for the functionality of most complicated inventions. At the same time technology has also facilitated considerably the possibility to reproduce and misappropriate software by competitors and consumers.

What makes the question of the impact of technological development on the patent system even more intriguing and important is the fact that the definition of what constitutes "technical" though not defined in the law is in practicing of central importance for the application and well-functioning of the patent system. The lack of definition of what the term entails as well as the uncertainties with

1 For instance in copyright law, technical neutrality means that copyright protection continues to apply in different media (for instance when a copyright protected work is copied on paper, saved on a hard disk or mobile device). On the other hand, technical neutrality in the field of patent law has concerned that principles of patent law are equally applied to inventions belonging in different technological fields. *See* for instance, Chris Reed, *Taking Sides on Technology Neutrality*, 4 SCRIPT-ed 263, 265 (2007).

2 See also, Craig, Carys, T*echnological Neutrality, Recalibrating Copyright Law in the Information Age*, Theoretical Inquiries in Law, (2016) Vol. 17 p. 601.

regards to the appropriate method of its assessment have given rise to contradictory rulings and legal insecurity. The question is of course how, do you reconcile technical neutrality with a delimitation of the term "technical" and whether this in fact is plausible in the field of computer-implemented inventions, where technology evolves rapidly and where inventions nowadays have multiple applications.

This article looks into the definition of the term "invention", and in particular of the use and meaning of the decisive criterion of technical effect/technical character. The objective of this article is to look into how the definition of the specific concept has evolved along way with technological development and whether this has functioned as a means of allowing for a broader flexibility of the law and of a direct canalisation of technological developments right in the heart of the patent system.

1 Technology and the Law

In the field of Intellectual Property Rights (IPRs) the relation between the law and the way the legal system adjusts in order to satisfy new needs and fit in the new technological (and thus very often even new business) environment has been rather straightforward. The fact/effect interface has been so direct that in some cases it has even led to seeing the evolution of Intellectual Property Rights as a mere reaction to technological change[3].

This approach finds very often its theoretical foundation in the work of two renowned theorists, namely Harold Demsetz and Robert Gordon.

According to Demsetz, property rights appear when social-economic conditions are such that the total benefits of such rights outweigh the social cost of creating and maintaining a property rights regime[4]. Naturally, in the field of patent law, the evolution of technology presents new possibilities of protection and exploitation posing thus its own challenges on how rights may be enforced but also on how patentability requirements may be applied. An interesting example illustrating Demsetz's theory is that of computer programmes. Initially considered a work/a text, better fit to be protected by means of the copyright system, are now due to technological developments and new applications in the core of all major technological achievements and inventions. Applying Demsetz's theory, it seems as a rather natural development that Article 52(1)(c) exclusion from patentability regarding "computer programmes as such" is to be interpreted restrictively[5].

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3 Craig, Carys J., (2016) L. p. 601.

4 Demsetz, Harold, *Toward a Theory of Property Rights*, The American Economic Review, Vol. 57, No. 2, Papers and Proceedings of the Seventy-ninth Annual Meeting of the American Economic Association. (May, 1967), pp. 347-359.

5 *See*, Wagner, Dana, T*he Keepers of the Gates: Intellectual Property, Antitrust, and the Regulatory Implications of Systems Technology*, Hastings Law Journal, (2000) Volume 51, Issue 6 pp. 1073-1129.

Robert Gordon[6], on the other hand, developed a purely reactive model stating that society at a particular stage of technological development has certain "needs" and that there is a link between these needs and the necessary legal forms/structures that are necessary in order to meet the needs[7].

Technological innovation is a core factor in the patent system, since it also stands for its subject-matter of protection. However what is equally interesting is how technological development interacts with societal changes, how technology impacts upon and alters the meaning of terms such as innovation and invention. After all, the patent system is, apart from being a legal system, a societal mechanism of protecting innovation, rewarding inventors and acquiring public knowledge about how technology works. This is also why patents exclude some categories of inventions from the protectable subject-matter[8].

Applying a reactive model on the impact of technological change to the patent system, would in fact also entail considering that certain changes in the technological sphere would also lead specific developments in the legal system. The question is thus whether the patent system is meant to evolve and develop towards a specific direction given new technological advancements in existing fields of technology or the appearance of new forms of technology. And if that is the case, does it also mean that the patent system will streamline the patentability requirements and the definition of the term invention and patentable subject-matter to take into account the technological developments? Will a re-balancing be necessary in order to preserve its fundamental principles, entailing also a review and why not even a re-definition of exceptions and of the scope of protection? Or will the reaction necessary be one entailing the broadening the possibilities for protection, when technology evolves, technology must be protected. Answering technological changes by adjusting the patent system might in fact lead either to a more extensive protection, or in fact to a more restrictive one[9].

The relationship between technological change and new forms of conduct was also offered by David Schön stating that technology is "any tool or technique, any product or process, any physical equipment or method of doing or making, by which human capability extended"[10]. Technological change may in fact be identified as a form of social change. Social change stands for the changes in what people think or do, while technological change concerns the change in what they are technologically capable of doing. The fears associated with technological change create a need to regulate and control by means of legal rules. Law is thus perceived as a means of posing a certain limit to technological

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6 Gordon, Robert, *Critical Legal Histories*, 36 Stanford Law Review 57 (1984).

7 *See* also, Synodinou, Tatiana-Eleni, *The principle of technological neutrality in European copyright. Myth or reality?,* European Intellectual Property Review, 2012, v. 34, n. 9, p. 618-627.

8 The patent system has a double function, to reward technological advancements but also to indirectly restrict inventions in technological fields that are more contradictory.

9 Moses, Lyria Bennett, *Why have a theory of Law and Technological Change?* 8 Minn. J.L. Sci. & Tech. P. 589.

10 Schön, David, *Technology and change: The new Heraclitus*, Oxford: Pergamon, 1967 p. 187.

development. Radical technological changes might require legal regulation, in fact even before these technological changes are accessible to society at large.

Although there does not seem to be a simple answer to this question, what appears to be obvious is that in the field of the patent system, a simplistic approach on the impact of technological development is not appropriate. A more nuanced view taking into consideration the historical and sociological background of technological is necessary.

The question that arises thus is whether the concept of invention has evolved during time and on the basis of technological development, or whether the application of law has proceeded in a manner totally independent and irrespective of technological advancements. Have inventions belonging to the rapidly changing digital world, and in principal computer-implemented inventions been treated more generously as their applications and potential functions have expanded, has technological developments led to a more restrictive treatment or have the terms "technical effect" and "technical character" evolved in the same way irrespective of technological field?

2 The Concept of "Invention" in the Field of Computer-Implemented Inventions

According to article 52(1) patents are granted to "inventions in all fields of technology…that….are new, involve an inventive step and are susceptible of industrial application"..

The text of the EPC does not contain any specific definition of the term "invention". It restricts however the grant of patents to patentable inventions that are new, have an inventive step and are susceptible of industrial application. Article 52(2) continues with a further definition of the term "invention" by not including subject matter that relates "as such" to a) discoveries, scientific theories and mathematical methods; b) aesthetic creations; c) schemes, rules and methods of performing mental acts, playing games or doing business and programs for computers, and d) presentations of information.

The interpretation of the EPO Boards of Appeal of Article 52(2) of the EPC has focused to the meaning of the term "technical character", a term that though not used in the text of the EPC, it remains of central importance for the application of the patent system[11]. In fact, when the applicant can prove that the subject matter has technical character, this will then be considered an "invention". An "invention" requires thus the presence of technical features[12].

Although the determination of the existence of not "technical character" is to be kept separate from the examination of the patentability requirements it remains of a decisive nature even for the examination of the patentability criteria.

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11 *See* also, Hanrahan, Francis, *Software patents, all or nothing? A comparison of the US and EU approaches,* (2001) I.P.Q. 22, 22.

12 Pila, Justine, *Software patents, separation of powers and failed syllogisms: a cornucopia from the Enlarged Board of Appeal of the European Patent Office*, Cambridge Law Journal, 70(1), pp. 203-228.

After all, both novelty and inventive step are examined on the basis of the technical features of the invention.

Already in the 1975, the guiding principle related to the application of article 52(2)(c) has been that if the subject-matter of a patent application could prove "a technical contribution to the known art, patentability should not be denied merely on the ground that a computer program is involved in its implementation". The ability of the the claimed subject-matter to provide that the invention produces a "technical effect" or to have a "technical character was decisive for its patentability[13].

The EPO does not provide any definition of the term "technical", and as a result it has been rather unclear what the exact meaning of the term of "technical contribution" and "technical effect" as the central concept for determining patentability is. What is clear is that the concept has evolved considerably since the first time it was mentioned by the EPO Board of Appeal (BOA) in the 1987 VICOM/Computer-related invention[14]. In the specific case, the patent application concerned a computer-implemented method for processing digitally encoded images. The computer program would in fact scan data representing an image and after that using a mathematical process, amend the data so as to alter the image itself[15]. Patentability was initially rejected on the basis of the fact that the function was based on a mathematical method excluded from patentability under Article 52(2)(a). Furthermore, the implementation of the process by a computer program was effectively a claim to a program, excluded by art. 52(2)(c). The EPO BOA overruled the decision of the Examination Division providing for the first fundamental distinction between abstract and mathematical processes and such that provide for a technical effect that should in fact qualify for patentability. In the specific case, the application concerned a technical process using a mathematical method, and not a mathematical method as such. The BOA continued by stating that a technical process that operates under the control of a computer program cannot be considered to be a computer program "as such"[16].

What has had a considerable impact for the case-law to follow, is what the court has stated, namely that "an invention that would be patentable in accordance with conventional patentability criteria should not be excluded from protection by the mere fact that for its implementation modern technical means in the form of a computer program are used. What is of decisive importance is what technical contribution the invention as specified in the claim when considered as a whole, makes to known art"[17].

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13 Dhenne, Matthieu, T*he assessment of technicality of computer-implemented inventions in Europe*, E.I.P.R. 2018, 40(5) pp. 295-300.

14 VICOM/Computer-related invention (T208/84) (1987) 2 E.P.O.R. 74 (Vicom case).

15 VICOM/Computer-related invention. Summary of Facts and Submissions, para. 2 available at "legal.european-patent-office.org/dg3/biblio/t840208ep1.htm".

16 *See* also, *Hilty, Reto and Geiger Christophe*, Patenting Software? A socio-economic analysis, (2005) 36(6) I.I.C. 615, 617.

17 *See* in this respect also the review of relevant case-law in Panagiotidiou, The patentability of computer programs, according to the Commission's new proposal for a directive and to the EPO Boards of Appeal decisions (2003) C.T.L.R. 126. See also Kaya, A. *A comparative*

The approach of the BOA in VICOM, that is that the invention needs to be considered as a whole and that what is central for the determination of whether Article 52(2)(c) exception applies, is whether the invention produces a sufficient technical effect that allows patentability was further confirmed in the KOCH & STERZEL/X-ray apparatus case[18]. The BOA affirmed in the specific case that an invention may in fact contain both technical and non-technical elements and be patentable.

Both VICOM and KOCH & STERZEL confirmed that inventions containing computer programs are patentable provided that they have a technical character. However they did not provide any clarification on what the term "technical" in fact means.

In Sohei[19], the EPO takes a step further in the delimitation of the term "technical effect" by providing that the fact that the method underlining the invention was not the same as the method that would be performed by a human being, is proof of the "technical considerations" that have figured as background to the invention. It is also these "technical considerations", that imply even the existence of a technical problem, in its turn solved by means of the invention. A further clarification was provided some years later with the two IBM cases referred to as the IBM/Twins[20]. In these rulings the BOA stated that in order to have a "technical effect" (enough to constitute an invention) one needs to provide a "further technical effect" going beyond the mere interaction between the program and the computer. In fact the BOA stated that the further effect is provided where the invention caused the software to solve a technical problem, this could in principle be the subject-matter of a patent.

Gradually. EPO case law evolved in a way for Article 52(2)(c) to allow for the patentability of a computer system programmed for use in a particular field (even in the field of business and economics), as long as it constitutes a concrete apparatus in the sense of physical entity[21]. This was also the first reference to the "any-hardware" approach that based patentability of computer-implemented inventions on the existence of a reference to hardware in the wording of patent claims. The case concerned a computerised system for controlling pension benefits. The patent application included two claims, a claim on the method controlling the system and a claim related to the apparatus for implementing the method. The Examination Division refused the application stating that it concerned a method of doing business. The BOA stated on the other hand that the patentability of the invention depends on the wording of the claims, a claim concerning a method that has a mere economic effect and does not produce a technical effect is a method of doing business and thus excluded from

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analysis of the patentability of computer software under the Trips Agreement, (2007), Ankara Law Review 43, 76.

18 KOCH & STERZEL/X-ray apparatus (1988) 2 E.P.O.R. 72.

19 TBA 3.5.1, 31 May 1994, T-769/92 Sohei, OJ EPO 1995 p. 525.

20 Computer program product I/IBM (T1173/97) (1998); Computer program product II/IBM (T0935/97) (1999).

21 T931/95 PBS/ C*ontrolling Pensions Benefits.*

patentability. The fact that a method previously performed by pen and paper is now performed by a machine does not in itself make it technical. On the other hand, the presence of an apparatus strengthens the patentability of the claim, under the precondition that this (the apparatus) fulfils the inventive step requirement[22].

Looking into the evolution of EPO case-law on notices that gradually the exceptions of art. 52(2) and 52(3) were interpreted more and more narrowly and the criterion of "technical character" received a more and more lenient understanding[23].

While the law "in theory" seems to have intended a limited patentability of computer programs, the law "in practice" evolved to the opposite direction. The question that arises is of course whether this is related to the technological evolution and the extended potentials of the computer programs industry, as well as the fact that modern technological innovations are in fact based on computer programs, or whether it has dependent on a trial-and-error method by the EPO Examination Divisions and Boards of Appeal.

Examples of inventions that have been considered to fulfill the "technical character" requirement concern:

-methods processing information using a conventional computer programmed in a specific way to carry out a computerized translation process provided a technical aspect to non-technical things such as dictionaries, word matching or the translation of compound expressions into a corresponding meaning[24].

- a method of providing expanded clipboard formats in a clipboard feature in a word processing system (which allows the user to cut and copy text for pasting to another section of a document) for transferring data between formats[25].

- a computer-implemented data structure for representing visual data (a picture access data structure) had technical character, because a playback device could only exercise its function of fast display of stored pictures using the data structure. The representation of information in the data structure was not directly usable by a human, but had to be processed by the technical playback device, thus the exclusion of presentation of information under EPC art. 52(2) was not applicable[2627].

However, the fact that the "technical effect" threshold is lowered does not necessarily mean that the threshold for patentability is also lower. The Hitachi decision[28], proves the counterbalancing effect between the generous

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22 Deschamps, Carole, *Patenting computer-implemented inventions in the US and Europe: the need for domestic and international legal harmony*, E.I.P.R. 2011, 33(2) pp. 103-114.

23 *See* the evolution of case-law from VICOM to IBM.

24 T 1177/97 (translating natural languages/SYSTRAN (EPO BOA 9 July 2002).

25 T 0424/03 (Clipboard formats I/MICROSOF) (EPO BOA, 23 February 2006).

26 T 1194/97 (Data structure product/PHILIPS) (EPO BOA, 15 March 2000).

27 *See* the T 0154/04 DUNS LICENSING ASSOCIATES/Estimating Sales Activity, where the EPO clarified that the major distinction between the practical scientific applications and the intellectual achievements.

28 Auction method/HITACHI (T258/03) (2004) OJ EPO 12/2004.

interpretation of the term "technical effect" and the inventive step requirement. The invention in question concerned an automatic auction system. In the specific case the BOA considered that the claims in question include technical features such as the "server computer", "client computers" and a "network", which also satisfy the subject-matter eligibility criterion of art. 52(1) EPC. At the same time, the Board concluded that these technical features do not in fact fulfill the inventive step criterion. The result is thus the same, when the "inventiveness" or "novelty" lies with the non-technical features of the invention, this will result to its non-patentability[29].

In the more recent case NOKIA/Method and system of shopping with a mobile device[30], the EPO considered the patentability of a method of planning a shopping trip in advance using a mobile device. Prior art of the specific invention consisted of a system for finding a single vendor in advance that could fulfill a customer's order, possibly including more than one of the desired items, based on their respective locations. The NOKIA invention involved a shopper entering two or more desired goods/services in the mobile device before going shopping, where consequently the device displayed an itinerary showing an order (sequence) in which the shopper can visit a group of vendors in order to obtain them. The itinerary is a function of a user profile (that would be decided on the basis of criteria set by the specific shopper, for instance, shortest distance or goods of cheapest purchase price). What is interesting with the specific case is the fact that neither the Examining Division nor the BOA engages in a discussion on whether the invention in question constitutes patentable subject-matter or not. In the specific case, the "technical effect" was not considered with regards to the definition of the scope of the specific "invention", but solely with regards to the examination of inventive step. In fact, the BOA supported the opinion that the novel aspects of the claim lacked any technical character. In order to reach this conclusion the Board had to consider three arguments presented by NOKIA, the answers to which provide us with a useful guidance as to how the identification of "technical features" is to be proceeded.

The first argument was based on the fact that a technical feature may interact with a non-technical so as to produce a technical effect. In the specific case, this entailed that information regarding the group of vendors interacts with the server in order to produce a technical effect in the selection of vendors and the transmission of processed information to the mobile device. The Board named this process, "technical leakage fallacy" and concluded that the intrinsic technical nature of the implementation leaks back into the intrinsically non-technical nature of the problem. In other words, technical considerations (servers and wireless transmissions) only come into play once the relevant features are implemented. The second argument presented by NOKIA concerned the fact that the method identified a group of vendors rather than a single one, which

29 Utku, Sinan, Strowel, Alain, *Development regarding the patentability of computer implemented inventions within the EU and US: Part 1 – introduction and the legal problem of patenting computer-implemented inventions*, E.I.P.R. 2017, 39(8), pp. 489-510.

30 NOKIA/Method and system of shopping with a mobile device (T1670/07) Unreported July 11, 2013 (EPO (Technical Bd App)).

implied the existence of a logistics problem. The Board held that producing an itinerary is not technical as it involves merely standard human behavioral concepts such as the fact that we are going to the bank first and after that to a supermarket. NOKIA continued that the fact that there is a physical act of actually going to the locations concerned included a technical character. In this respect, the Board responded by "the broken technical chain fallacy", meaning that the technical process is in fact interrupted by the action of the user. In other words, in the specific case any possible effect was in fact dependent upon the user's reaction to the itinerary[31].

Finally, the Board considered that giving automatic visual indications about conditions prevailing in an apparatus or system is a technical problem (see for instance the simultaneous optical display of a current and ideal gear on the basis of the condition of the gearbox), but in the specific situation, shopping is per se non-technical. Consequently, the availability of goods in a shop or information relating to prices may not be comparable to that of the status of a technical system. Finally and although NOKIA's method include a server and a mobile device that are of course per se technical, the invention at stake displays non-technical information and not information about the devices themselves.

With regards to NOKIA's third argument, namely that prior art managed to identify only one vendor, and that NOKIA's application reduced the number of failed attempts considerably, the Board concluded that there was in fact no technical hinder as to why the person skilled in the art would not have considered modifying the prior art in obvious ways to solve the problem, and thus the invention lacked inventive step.

A review of EPO case-law with regards to the scope of Article 52(2)(c) reveals a certain evolution in the way computer-implemented inventions are perceived, in the evaluation of their technical character/technical effect as well as in the argumentation relating to its assessment. Even though ruling such as that in the NOKIA case seem to provide that the way to patentability of computer programs is not completely free of hinders, the fact that Article 52(2)(c) exception is interpreted narrowly is most probably based on the acceptability that computer programs are nowadays much more than literary works. They stand in fact for technological advancements and complicated technical solutions[32].

3 "Technical Effect" and "Technical Character" in Methods of Presentation of Information

The difficulties in the assessment of the "technical character" or "technical effect" when determining whether a claimed method or apparatus is in fact an invention under Article 52(1) and the challenges posed in this respect by the

31 NOKIA/Method and system of shopping with a mobile device (T1670/07).

32 *See* also, Wilson, David, Pearce Daniel,and Sharp Christopher, *EPO:patents-patentability of computer-implemented inventions*, E.I.P.R. 2010, 32(9) pp 83-87.

advancement of technology are not the sole privilege of computer-implemented inventions.

Article 52(2)(d) provides yet another exception from the concept of invention, that of presentation of information. Presentation of information under 52(2)(d) of the EPC includes any form of information (such as visual or, audio) and covers both its cognitive aspect as well as the means of communication[33]. However, the fact that the claims include purely cognitive (and thus non-technical) aspects does not automatically mean that they are excluded from patentability. Presentation of information that assists the user in achieving a technical task has a technical effect and is as such patentable[34].

Nonetheless, the Guidelines continue by stating that whether a specific invention falls under the scope of Art. 52(2)(d) might depend either on its content or on the way it is presented. When the information has as its sole objective to assist the recipient in making a purely non-technical decision, then the presentation of information is non-technical:

> "Information representing a state of a non-technical application run on a computer system, such as the state of a casino game, a business process or an abstract simulation model, constitutes non-technical information. This type of information is exclusively aimed at the user for his subjective evaluation or non-technical decision-making which is not directly linked to a technical task.[35]"

This means that what is important is the role this information plays: will it be used for a technical purpose or not?

The Guidelines continue:

> "A feature defining a presentation of information produces a technical effect if it credibly assists the user in performing a technical task by means of a continued and/or guided human- machine interaction process (T 336/14 and T 1802/13). Such a technical effect is considered credibly achieved if the assistance to the user in performing the technical task is objectively, reliably and causally linked to the feature.[36]"

The Guidelines add yet another requirement, namely, the manner of presenting information should produce in the mind of the user an effect that does not depend on the user's psychological factors but on purely objective physical parameters. The choice of one or another way of presenting information, when this is based on the subjective preferences of the recipient (some prefer that information is presented in numerical way, others in text, yet others that the information to be conveyed in writing in some audio-visual manner) may thus not be considered

33 The Guidelines for Examination of the EPO, valid from 1st of November 2017, include an interesting revised (and rather detailed) section G II 3.7, dedicated to the patentability of claims based on presentation of information.

34 Confirmed also in T336/14 and T1802/13.

35 G II 3.7.

36 G II 3.7.

technical. On the other hand, when the choice of presentation mode depends on the recipients physiological attributes, the presentation of information has a technical character[37].

One of the examples referred to in the Guidelines is that of a visual aid that permits a surgeon to position an implant in a more precise, timely and credible manner. Such a presentation of information would in fact provide a technical effect. Yet another interesting example referred to in the Guidelines is that of a soccer game:

> "In a video soccer game, the particular manner of conveying to the user the location of the nearest teammate by dynamically displaying a guide mark on the edge of the screen when the teammate is off-screen serves the technical purpose of facilitating a continued human-machine interaction by resolving conflicting technical requirements: displaying an enlarged portion of an image and maintaining an overview of a zone of interest which is larger than the display area"[38]

Both the revised EPO Guidelines as well as the above mentioned EPO case-law leave us with some important questions. The main question to be answered is where do we draw the line of patentability when it comes to inventions that cover methods related to the presentation of information? It seems that the above-stated examples in fact allow for a certain range of interpretation. When the presentation of information (both content and method of presentation) allows the recipient to perform a technical act (in the previous examples, placing an implant or identifying a player) in a more timely, precise and credible manner, it will be considered to have a technical effect. Furthermore, methods of presentation of information that take into account the physical characteristics of the recipient, providing thus for technical solutions fall under the scope of patentable subject-matter. On the other hand such presentations of information that serve as a grounds for non-technical decisions, or such that serve the subjective needs of the recipient are excluded from patentability[39].

A new parameter introduced with regards to the delimitation of Art. 52(2)(d) exception is the subjective character of technicality. It is in fact not the method itself that needs to be technical but rather the objective of the presentation. The question posed is thus not whether the technical character is inherent to the method at stake, but rather whether the method of presentation of information as such will be used in a technical process, or a process with a technical result. In this respect that would in fact mean that the concept of invention will be determined on elements external to the invention, that is information on the application/use of the invention and not on the function of the invention itself.

Having this as a starting point one cannot avoid wondering whether this also means that claims concerning presentation of information in for instance lean

37 Interesting case with similar reasoning, T1562/11 (Closing out white spaces/SAP) (3 June 2015)).

38 G II 3.7.

39 *See* also, T1143/06 (Data selection system/BRITISH TELECOMMUNICATIONS) (1 April 2009).

manufacturing processes would equally be patentable? Lean manufacturing covers methods that involve the development of information and the appropriate communication of the information to users (employees involved in the production process). It has as an objective to minimise waste and costs and to maximise efficient production, taking into consideration objective factors such as the number of employees, the space, the nature of the product, and the constraints of the manufacturing processes. An application of the EPO Guidelines would lead us to the conclusion that although lean is per se not technical, it might in fact provide a technical result, since it is presented proactively, depends on the user's physical parameters, and its goal is to enable the user to perform a task in a more efficient and precise manner. The result of the different steps of a lean production method are in fact technical (such as reduced time, decreased number of accidents, and enhanced quality of products). Against this backdrop, it seems that the new G II 3.7 EPO Guidelines open up new opportunities with regards to the definition of "technical character" and "technical effect" and thus also to the definition of patentable subject-matter[40].

The interpretation of Article 52(2)(d) is in line with that of Article 52(2)(c). In the NOKIA case, a computer-implemented invention was denied protection taking into consideration the fact that the result of the invention was not to be used for a technical process but rather for a non-technical one (that of shopping). One cannot fail to wonder that this "extrinsic" determination of an invention's technical character is dependent on the evolution of technology in the field (that is of the diversified forms of application of one invention), or just a legal technical means of reasoning around a complicated area of law.

4 Concluding Remarks

There is no doubt that technological developments have an impact on the law. When considering the area of law that is concerned with the protection of technological developments this interrelation becomes just too apparent. There are situations, clear-cut ones one could say, where technological advancements have had a strong impact on the patent system, calling thus for an immediate response in terms of change in the legal framework or at least for a clarification. The patentability of biotechnological inventions constitutes such a case. The possibility to patent living organisms and parts of the human body called for the legislator's reaction. In this respect, one could thus say that "law is technology"[41].

There are however technological advancements that induce more subtle, though not necessarily less complicated, challenges to the way the patent system

40 *See* Utku, Sinan, Strowel, Alain (2017) p. 497.

41 *See* for instance Cockfield, Arthur, *Towards a Law and Technology Theory*, Manitora Law Journal Vol 30 No 3 pp. 383-415. For another very interesting discussion on the impact of technological advancements on IP law see, Bently, Lionel, *Copyright and the Victorian Internet: Telegraphic Property Laws in Colonial Australia*, (2004), 38 Loy. L.A. Law Review pp-71-95.

is interpreted and applied, such as the case of computer-implemented inventions. Such technological advancements need also to be handled, and in absence of legislative amendments, the application of law needs to be proceeded in such a way as to match the needs and take into consideration the challenges raised by the new inventions. A legislative reaction is often time-consuming and not completely uncomplicated, while technological advancements are often rapid. However, the time needed in order to bring legislative change is not always a negative factor. It may in fact be necessary in order to be able to grasp the implications of technological changes. In the field of computer programs we have moved from computer programs ameliorating photo quality to AI and self-driving cars. Determining the "inventiveness", and the "technical character" of such inventions becomes thus a complicated task and one that necessarily needs to be treated with a certain openness and flexibility.

The law in general, and the patent law in particular, has as an objective to treat inventions in the same way, and apply equally the patentability requirements. That is also why it generally operates on the principle of technological neutrality. However in lack of a definition of the term "invention" the assessment of the "technical effect" or "technical character" has a decisive effect on the determination of patentable subject-matter and is proceeded on a subjective case-to-case basis. It is rather hard to envision a technically neutral patent system, when the definition of its "core" concept, that of "invention" is clearly technology-dependent[42].

Applying the theory of David Schön, the advancements of digital technology has undoubtedly changed the boundaries of what humans can do, and as a result provided for a social change that needs to find a counterbalance in the way the patent system is interpreted and applied. It remains to be seen whether this will lead to a more extensive approach where the value created by means of new technological applications will lead to an extended flexibility of the boundaries of patentability as observed in the case-law discussed above, or whether the fear for the endless applications of digital technology (in for instance AI) will lead to a need to regulate and restrict even if that is by the indirect means offered by the patent system.

42 *See* also Gordon, Robert, *Critical Legal Histories* (1984) 36 Stanford law Review pp. 59-65.