

Recent Developments Regarding the Patentability of Computer Implemented Inventions within the EU and the US: Part 1—Introduction and the Legal Problem of Patenting Computer-Implemented Inventions

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The subject-matter eligibility criteria applied by the EPO and in the US impose significant constraints on patenting computer-implemented inventions (CI inventions) in these jurisdictions. There do not appear to have been significant changes to the EPO criteria over the last few years; by contrast the interpretation and application of the US criteria have significantly changed through and following the US Supreme Court's 2014 Alice decision, arguably rendering it more difficult to obtain and enforce patents directed to CI inventions in the US. However, both the EPO and US methodologies for determining subject-matter eligibility involve legal uncertainty and present difficulties for practitioners, applicant and patent holders. Part 1 of this article analyses and compares the current standards for patenting CI inventions in the EPO and in the US. Today, it cannot be concluded that one or

the other methodology is clearly more liberal in finding CI inventions to be subject-matter eligible across all contexts.

Introduction

Overview

This article, which is based on a study commissioned by the European Commission, addresses the trends and current practices in the area of patentability of computer-implemented inventions (CI inventions) within the EU and US. It explores special problems of patentability in this technology area, and in particular analyses if and when CI inventions satisfy the subject-matter eligibility requirements for patentability under the current law (1) developed by the Boards of Appeal of the European Patent Office in connection with European patent applications (EPO law), and (2) applied by US courts and the US Patent and Trademark Office. This article complements the 2008 Report entitled “Study of the Effects of Allowing Patent Claims for Computer-Implemented Inventions”, which was prepared for the European Commission.¹ Whereas the 2008 Report was mostly focused on the impact of patenting of CI inventions on innovation and the policy implications, this article is mostly focused on the evolution of the rules governing patent eligibility of CI inventions and the application of these rules by courts and administrative bodies. The economic considerations and policy implications of the 2008 Report as summarised below remain generally valid. Patent quality remains an issue today, and not only in the US; furthermore, litigation by patent assertion entities using patents in the field of CI inventions remains a serious concern, especially in the US. An analysis of patent assertion entity-related trends goes beyond the scope of the present article.

Part 1 of this article initially discusses considerations for protecting CI inventions using intellectual property, and in particular, patents. It then briefly discusses the European and US patent systems, and classes of CI inventions. Part 1 then focuses on the current rules governing the patentability of CI invention in the EPO and in US, and concludes with a comparative analysis of the rules and current practices.

Part 2 of this article, which is to appear in a future issue of this journal, undertakes an empirical study of patents and patent disputes in the nascent area of cloud computing, and analyses the impact of the eligibility rules in this technology area. Part 2 also discusses policy implications of the eligibility rules and provides thoughts for further studies in this area.

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¹ R. Bakels et al., “Study of the Effects of Allowing Patent Claims for Computer-Implemented Inventions, Final Report and Recommendations to the European Commission” (June 2008) (2008 Report), <http://bookshop.europa.eu/en/study-of-the-effects-of-allowing-patent-claims-for-computer-implemented-inventions-pbKK0114632/> [Accessed 1 June 2017].

Intellectual property protections in software and computer technology

Intellectual property (IP) rights are intended to incentivise innovation in the specific technology areas in which they are sought and obtained. CI inventions, i.e. all inventions that can be put in practice through the use of a computer considered as a general-purpose or specific-purpose programmable machine, and in particular, inventions incorporated in a computer program, may be protected by patent under certain conditions. Additionally, computer programs, including their corresponding source or object code, as well as their preparatory design materials, can be protected by copyright, which is harmonised in the EU by the 2009/24 Software Directive (which codified Directive 91/250 on the legal protection of computer programs).

Copyright protects expression in the form of an original work, such as a novel, a painting or a musical composition. Copyright law provides the author of the work with a bundle of rights, including, among others, the right to prevent unauthorised copying of the work, and the right to adapt the work and create derivative works. National copyright laws in the EU and beyond protect computer program code as literary works. In particular, the Software Directive defines the scope of protection of computer programs in the EU Member States. This protection only extends insofar as the underlying computer program code (and, depending on the jurisdiction, possibly the structure, sequence and organisation (SSO) of the code); it does not protect, for example, an innovative algorithm that is expressed in the code. Similarly, other functional elements of a computer program cannot be protected by copyright. According to the case law of the Court of Justice of the EU, a graphical user interface is not considered part of the underlying computer program, and therefore not subject to the copyright regime under the Software Directive, but may be protected as a graphical or audio-visual work under the 2001/29 Copyright in the Information Society Directive.²

Although the copyright holder can prevent an unauthorised party from copying the code that implements an algorithm, she may not assert copyright protection to prevent others from implementing the algorithm using different code. For that reason, copyright protection in the computer programming area is generally thought to provide the greatest benefit in preventing large-scale copying of computer programming products, such as is the case of software piracy.

Patents, on the other hand, may protect the invention that is implemented in a computer programming product. Although a patent may also not be used to protect an algorithm by itself, i.e. divorced from any technological context in which the algorithm is implemented, a patent directed to an algorithm implemented on a device may prevent the unauthorised making, use and/or sale of the

device implementing that algorithm. In this respect, patents may provide more comprehensive protection compared to copyright.

In particular, an inventor may obtain a patent directed to her invention, assuming the invention satisfies the criteria for patentability and the inventor fully discloses the invention in her patent application. The patent, once obtained, provides a period of exclusivity during which the patentee may exclude others from using the invention. While copyright infringement requires showing that the defendant copied the code or protected work, a patent infringement can exist in the absence of any copying. Thus, a patent holder may be able to show infringement and obtain damages and injunctions from another party who independently developed the invention. No proof of an unfair taking or copying is needed. This provides the incentive for inventors and companies to obtain patents for their inventions.

Further, because patent applications and patents are published, public domain knowledge increases as a result of the filing of a patent application, compared with the situation in which the inventor does not apply for a patent and keeps the invention secret (for example, by exploiting the invention secretly). In this way, the patent system both encourages innovation in the technological arts, as well as increasing the amount of available public domain information regarding the relevant technologies, which may contribute to driving further innovation.

There are, however, risks that arise from a patent protection that is too broad, too strong or too easy to obtain. Weak patents, which are granted on inventions that do not fairly or fully satisfy the criteria for patentability, may actually harm innovation. For example, such patents may be asserted in lawsuits against innovative companies, which may impose financial, opportunity or other costs on the companies in defending against such lawsuits. If there are a large number of such cases, the benefits of a patent system may not outweigh its potential harms. Some of the risks associated with a patent regime permitting weak CI invention patents to issue are discussed in the 2008 Report.

2008 Report on computer-implemented inventions

The 2008 Report entitled “Study of the effects of allowing patent claims for computer-implemented inventions” (CI inventions) focused on the risks associated with a policy of setting a low threshold for subject-matter eligibility for granting patents on CI inventions (and thus too easily granting patents to such inventions.) The 2008 Report distinguished between CI inventions and “software patents”. Using the definition in the 2002 Proposal for a Directive of the European Parliament and of the Council on the patentability of computer-implemented inventions (Commission proposal COM(2002) 92), it defined a CI invention as including

² *Bezpečnostní softwarová asociace — Svaz softwarové ochrany v Ministerstvo kultury* (C-393/09) EU:C:2010:816; [2011] E.C.D.R. 3.

“any invention the performance of which involves the use of a computer, computer network or other programmable apparatus and having one or more *prima facie* novel features which are realised wholly or partly by means of a computer program or computer programs”.³

The 2008 Report, on the other hand, referred to a common understanding among software engineers and economists that the term “software patent” denoted a patent that can be infringed by software alone.⁴

The 2008 Report found that allowing the patentability of CI inventions (1) had the potential to stifle innovation by creating a minefield for programmers; (2) could lead to undue monopolies on interface standards that are magnified by network effects; (3) could jeopardise open-source software, which it called “the most innovative development of past decades”; and (4) could lead to the tragedy of the anti-commons, in which too many patent rights granted to too many actors threaten innovation and the development of technology by bogging down the system with a profusion of patent disputes and litigation.⁵

While emphasising that the patent system may cause more harm than good by imposing barriers to innovation and competition, as well as large transaction costs (which accrue in obtaining and enforcing patents), the 2008 Report advocated neither abolishing the patent system as a whole nor disallowing the patentability of CI inventions.⁶ Instead, as long-term solutions, the 2008 Report proposed (1) increasing the disclosure requirements for patents to weed out low-quality patents; (2) weeding out low-quality patents through financial means that pose proper incentives, such as adjusting application and renewal fees (e.g. sharply increasing renewal fees for older patents should theoretically lead to the maintenance of higher-quality patents and the abandonment of lower-quality patents); and (3) legislative solutions outside of the patent system directed to providing, for example, immunity from patent liability for inventions directed to interoperability and technology standards.⁷

The 2008 Report briefly touched upon the subject-matter eligibility requirement for patentability of CI inventions as applied by the EPO.⁸ It found that the EPO’s requirement for a technical contribution was not coherent, led to legal uncertainty, and did not clearly prevent certain subject-matter from being patented.⁹ More importantly, it stated that the EPO, as a technocratic organisation focused on technical requirements for patentability, lacked the ability of oversight based on a comprehensive economic view.¹⁰ Regarding subject-matter

eligibility requirements in the US, the 2008 Report mentioned in passing, based on now out-dated US law, that there were essentially no limits on pure software and business method patents in the US, implying that that such low thresholds for patentability had led to a tidal wave of applications and low-quality patents.¹¹

It is not entirely clear whether the policy conclusions and recommendations reached in the 2008 Report provide a path to a stronger software-based economy in Europe. On the other hand, the opposite has not been demonstrated either. The 2008 Report was sceptical at best regarding any positive economic consequences of the patentability of CI inventions. The patent eligibility criteria for CI inventions in Europe have been much stricter than those in the US until relatively recently. At the same time, the European software industry is generally perceived to be less dynamic and strong compared with that of the US. For example, other than a few isolated exceptions, such as SAP SE (SAP), there appear to be no large European software-focused or internet-based companies such as Microsoft, Amazon, Google, Facebook and Apple that are global leaders. Nevertheless a number of European companies have been able to integrate innovative digital solutions in their products and processes. Additionally, based on venture capital activity in the US and Europe, it cannot be said that European software-based SMEs are in a better or stronger position compared with US software-based SMEs.¹² Thus, one may infer that a relatively strict approach to patent eligibility for CI inventions does not automatically translate into a vibrant marketplace for software. On the other hand, the fact that the converse has not been demonstrated suggests that it is possible that the policy and law on the patentability of CI inventions have no or little impact on the advancement of the software industry. It also seems that the European approach of patenting CI inventions has not prevented the development of open source software. We tend to conclude that the impact of the legal rules and practices for patenting CI inventions in fostering or blocking software-related innovation has been overstated in past discussions.

The European and US patent systems

One practical problem that arises in considering the rules for patentability of CI inventions in Europe is the fact that there is no single, harmonised patent system in Europe. In particular, patents in Europe may be obtained by either (1) filing a number of national patent applications at the relevant patent offices of the EU Member States and prosecuting each of these to grant, or

³ 2008 Report, p.5.

⁴ 2008 Report, p.5.

⁵ 2008 Report, pp.11–12.

⁶ 2008 Report, p.30.

⁷ 2008 Report, p.30.

⁸ 2008 Report, pp.7–9.

⁹ 2008 Report, p.8.

¹⁰ 2008 Report, p.21.

¹¹ 2008 Report, pp.21–22.

¹² *Towards a European Software Strategy: Working Group 4: Public Procurement — Financing Software Innovation*, Draft v.005 (final document, 24 March 2009).

(2) filing a single application at the European Patent Office, prosecuting it to grant (thus obtaining a European patent) and then validating that European patent in the relevant EU Member States of interest. Currently, patents in EU Member States may only be enforced by separately filing patent suits in the court systems of the EU Member States where a national patent has been granted or where an EPO-granted European patent has been validated.¹³ Such court proceedings are subject to national patent laws and regulations. Although the substantive patent laws of the EU Member States are by and large consistent with one another and that of the European Patent Convention (EPC), which provides the substantive patent law applied by the EPO, there are in fact differences in interpretation and application of patent law across EU Member State jurisdictions. Further, asserting a single EPO patent in a number of European jurisdictions involves initiating separate patent infringement lawsuits in each of those European jurisdictions, greatly increasing the costs associated with litigation.

Further, and apart from enforcement, there is also fragmentation of the method of obtaining a patent in European jurisdictions. For example, in a first scenario, an applicant desiring a patent for her invention in France, Germany and the UK may file the respective translations of the same patent application in the respective national patent offices of these jurisdictions. The applicant would then have to separately prosecute the application in each of these patent offices and separately satisfy the requirements set forth by the examiners of these offices during prosecution. In a second scenario, the applicant may file and prosecute a single patent application at the EPO. Assuming the EPO eventually granted a European patent, the applicant would then have to validate the European patent separately in each of the respective national patent offices through an essentially clerical procedure to obtain the desired national patents.

Although an applicant could obtain the desired French, German and UK patents in either scenario, and although the formal requirements for patentability may be substantially similar in France, Germany, the UK and before the EPO, there inevitably are differences in interpretation that effectively lead to differences in practice. For example, most legal systems provide that rejections of a patent application by the national patent office may be appealed to the respective national court systems. These national court systems decide individual cases based on principles established and prior cases heard in their respective jurisdictions. In this way, a nationally specific practice regarding patentability inevitably develops and evolves in each of these jurisdictions which may not be entirely consistent with those of the other jurisdictions, and which may not be entirely consistent with the practice of the EPO. Consequently, and in

practice, the requirements that applicants face in these jurisdictions may differ from one another as well as differ from those of the EPO.

In the US, there is much less geographical diversity in the substantive patent law that is applied to CI inventions; there is a single patent system in which the same patent law is applied by the US Patent & Trademark Office (USPTO) during the prosecution stage as is applied by the courts during enforcement. Further, a single appeals court, the US Court of Appeals for the Federal Circuit, hears nearly all appeals from courts of first instance decisions relating to patent issues (where disputes heard include both appeals from USPTO decisions during patent prosecution regarding patentability and disputes relating to patent infringement and validity between parties.) This tends to result in a more coherent and predictable patent law, at least compared with that of European jurisdictions taken collectively.

One other characteristic of the US patent system is that patent infringement damages awards are much higher, on average, in the US compared with those of European courts. This is likely to incentivise patent holders to assert their US patents in lawsuits to a greater degree than European patents. On the other hand, because of the much more liberal standard for evidentiary discovery in lawsuits in the US, US patent litigation is far more expensive than patent litigation in European jurisdictions. This fact is likely to make it harder for SMEs in the US to assert their patents compared with SMEs in Europe.

Given the complexity of the European system, one practical problem in undertaking a comparison of the European and US rules in connection with CI inventions is which European patent system to use in carrying out the comparison. For example, should one use the German system as the best representative European practice, given that an overwhelming majority of patent-related disputes in Europe are heard by the German courts? Or should one use the EPO practice (including the decisions of the EPO Boards of Appeal) as being representative, since most patent applicants interested in obtaining a patent in several EU countries apply for their patents through the EPO? Or should one comprehensively study the case law in all EU jurisdictions, try to identify commonalities in case law and national patent office decisions across all these EU jurisdictions, and then enunciate a “European” patent practice based on any such commonalities?

In undertaking the current limited-scope study, the authors have chosen the second option, i.e. using EPO-developed rules, as representative of European practice. Unlike the first option, this option does not focus only on rules for patent eligibility of CI inventions in a single European jurisdiction (albeit the country with the highest number of court decisions), and unlike the third, does not entail a wide-ranging project that has low

¹³ Pursuant to a proposed international agreement among nearly all EU Member States, a Unified Patent Court is to be established for the settlement of disputes relating to European patents and European patents with unitary effect: Agreement on a Unified Patent Court [2013] OJ C175/1. If and when the Agreement comes into force, there will be a mechanism for pan-European enforcement of European patents and European patents with unitary effect in a single court system. The implementation of the Unified Patent Court system is now in doubt, however, owing to the outcome of the referendum in June 2016 in which the UK voted for Brexit. According to the terms of the Agreement, the UK is one of three EU Member States that must ratify the Agreement before it can go into effect. Whether that would happen, or whether the Agreement would be changed to remove the UK from its ambit, was still not clear at the time this article went to press.

prospects for success, given the large number of patent systems involved (i.e. all EU Member States and the EPO). Further, it is likely that applicants would choose to obtain patents on high-value CI inventions in several European jurisdictions rather than just in a single or two European jurisdictions, rendering it more likely that they would file applications on such inventions at the EPO, given the more favourable costs regime compared to the scenario of avoiding the EPO and filing several European national applications at the respective national patent offices. Therefore, the EPO rules on the patent eligibility of CI inventions should act as a good and workable proxy for the rules in Europe as a whole.

Accordingly, this article deals with this methodological problem by focusing on the patentability criteria for CI inventions as applied by the EPO during prosecution of a European patent application.

A major new European development—the Unified Patent Court

A Unified Patent Court (UPC)¹⁴ is being established pursuant to an intergovernmental treaty among nearly all EU Member States. The UPC is to have exclusive competence in respect of certain designated European patents (in particular, European patents with unitary effect, which will be obtained through designation at the EPO by applicants for European patents), subject to certain exceptions during a transitional period. The UPC, however, will not have any jurisdiction over national patents obtained through the patent office of an EU Member State.

The UPC would for the first time establish a single EU court system to hear patent disputes. For this reason, it is likely that it will eventually develop a more coherent and uniform interpretation of patent rules within the EU, such as the rules for patent eligibility of CI inventions. However, given that the UPC will not have exclusive jurisdiction of all patent disputes within the EU, its establishment is unlikely to eliminate all non-harmonised aspects of patent law across the EU. This is compounded by the fact that the national patent office routes for obtaining patents in EU Member States will continue to be available to applicants. However, the UPC is probably a major first step in the direction of an EU patent law that is truly harmonised based on case law decisions.

Whether the UPC continues to be feasible is currently in doubt owing to the vote for Brexit in the UK referendum in June 2016. Based on developments occurring before this article went to print, it appears that the UK is likely to ratify the UPC despite the Brexit vote and the UK's anticipated departure from the EU. However, if the UK actually ratifies the UPC, certain changes to that treaty will probably have to be made to handle the UK's eventual departure from the EU. Alternatively, it is possible that the Brexit vote will render it more difficult to obtain ratification of the UPC in

remaining non-ratifying countries. It is even possible that the UPC will be scrapped. What is clear is that, assuming the UPC is not scrapped, the timetable for its coming into effect will likely be delayed even further than anticipated.

Types of CI inventions

As outlined in the 2008 Report, CI inventions vary widely in scope and other characteristics:

“‘[S]oftware inventions’ is a misleading designation. And if still ‘software inventions’ are distinguished, it should be acknowledged that the realm of ... ‘software-related inventions’ conceivably encompasses inventions with widely varying economic characteristics, a reason why previous software patent studies rarely lead to unequivocal recommendations, despite the conventional wisdom that ‘software patents’ do more harm than good (Bakels & Hugenholtz 2002). The diversity of ‘software inventions’ becomes apparent e.g. from landmark court cases, showing topics as varying as oscilloscope image enhancement (VICOM, T 208/84) and database synchronisation (IBM Computer Program Product I, T 1173/97). Previous studies have classified CIIs into a large number of ‘case groups’ (Blind, Edler, Nack & Straus 2002).”¹⁵

Given this diversity, it is difficult to enunciate a scheme for classifying CI inventions that is satisfactory for all purposes. However, for purposes of illustration, we provide below a description of some specific types of CI inventions discussed in this article:

Graphical user interface inventions

These are CI inventions directed to the presentation of information on a screen of a device for the benefit of a human user of the device. For example, there could be innovation that is potentially eligible for patenting in connection with automatically arranging multiple windows opened by a user on a screen in such a way that maximises the access of the user to the multiple windows without requiring excessive user rearrangement of the windows.

Image processing inventions

These are CI inventions directed to the manipulation of digitised representations of images to maximise the quality of the images and/or the throughput of images through a limited transmission channel.

Data transmission inventions

These are CI inventions directed to improving data transmission, by, for example, compressing data to maximise data transmission through bandwidth-limited channels, or encrypting data to ensure secure transmission.

¹⁴ See <https://www.unified-patent-court.org/> [Accessed 1 June 2017] for relevant sources and the latest information on the UPC.

¹⁵ 2008 Report, p.12.

Cloud computing technology inventions

As defined by the US National Institute of Standards and Technology (NIST), cloud computing is

“a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction”.¹⁶

Most, or possibly nearly all, cloud computing inventions are CI inventions, because they necessarily involve one or more networked computers. We discuss cloud computing in more detail further below in this article, and have carried out an empirical study of the impact of patent eligibility criteria in the US and in Europe on cloud computing patents, which is also discussed further below.

Patenting CI inventions

A chronology of developments at the EPO and in the US

The patent eligibility of CI inventions has been a difficult issue on both sides of the Atlantic. In Europe, the law of patent eligibility of CI inventions has evolved through the case law of the EPO's Technical Boards of Appeal from initial decisions that required a technical effect or contribution that went beyond ordinary interactions between software and hardware, to an approach that in most cases imposed a relatively low threshold for finding a technical effect, but required, as part of the distinct inventive step analysis, that only features contributing to technical character be considered in determining whether the invention satisfied the inventive step requirement. This evolution, which took place over a time scale of approximately six years, led the Enlarged Board of Appeal of the EPO in 2008 to consider questions relating to the patentability of CI inventions referred to it by the President of the EPO.¹⁷ Although the Enlarged Board of Appeal found the referral to be inadmissible on the grounds that the EPO case law was not inconsistent and reflected normal legal evolution, there has been continued criticism that EPO case law on the patentability of CI inventions is not coherent.¹⁸

In the US, the rules regarding the law of patent eligibility of CI inventions have fluctuated even more rapidly compared to Europe. Although the US Supreme Court had found certain CI inventions patentable in a decision as early as 1981,¹⁹ the USPTO did not begin

granting patents to CI inventions in great profusion until after a 1998 appeals court decision appeared to greatly lower the patent subject-matter eligibility threshold in a decision in which the court stated that a calculation that produces a “useful, concrete and tangible result” is in principle patentable.²⁰ CI inventions, including CI inventions that were also business methods, began to be patented in increasing numbers throughout the early years of the millennium. This period was also characterised by a continually increasing number of patent assertion entity litigations based on such patents (many of which were thought to be of low quality) in the US.²¹ The tide finally turned beginning with a string of Supreme Court decisions, including the *Mayo* decision of 2012, and the Supreme Court's subsequent decision in *Alice*, which more specifically focused on the patentability of CI inventions.²² These decisions have been interpreted by the USPTO, the courts and most US practitioners as significantly raising the threshold for subject-matter patent eligibility of CI inventions in the US.

Nature of the legal problem

The 2008 Report focused on the economic considerations and consequences of patenting CI inventions, while noting that the legal rules determining patent subject-matter eligibility of CI inventions were not coherent.²³ Regardless of the potential economic impact, why has it been so hard to articulate a coherent set of rules in this area that are capable of easy application by the patent offices, courts, practitioners, patentees and patent applicants? One reason may be the great diversity of types of CI inventions that may be covered across vast technology areas, and the various levels of abstraction in which such CI inventions may be attempted to be patented. For example, at one extreme, a CI invention may involve, at a relatively high level of abstraction, conversion of units from one system to another, e.g. from metric to British Imperial units and vice versa. Assuming other requirements for patentability, such as novelty and inventive step, are satisfied, such an invention may be patentable, subject to subject-matter eligibility requirements. Most practitioners, however, would likely agree that allowing subject-matter eligibility of such an invention would provide the patentee the right to exclude others from using the invention in a vast array of scenarios, independent of the particular technology area of application. For example, potential users would be pre-empted from using the invention in areas of application as distinct and varied as space technology (e.g. users in a space programme project involving the ESA and NASA), automotive technologies (e.g. car

¹⁶ P. Mell and T. Grance, *The NIST Definition of Cloud Computing, Recommendations of the National Institute of Standards and Technology*, Special Publication 800-145, National Institute of Standards and Technology, US Dept of Commerce (2011) (NIST Definition).

¹⁷ *Programs for Computers* (G-3/08) [2010] OJ EPO 17 (EPO Enlarged Bd Appeal, 12 May 2010), [http://documents.epo.org/projects/babylon/eponet.nsf/0/DC6171F182D8B65AC125772100426656/\\$File/G3_08_Opinion_12_05_2010_en.pdf](http://documents.epo.org/projects/babylon/eponet.nsf/0/DC6171F182D8B65AC125772100426656/$File/G3_08_Opinion_12_05_2010_en.pdf) [Accessed 1 June 2017].

¹⁸ 2008 Report, pp. 6–9.

¹⁹ *Diamond v Diehr* 450 U.S. 175 (1981) (finding that the use of an algorithm to control the carrying out of a physical process did not preclude patentability of the invention).

²⁰ *State Street Bank & Trust v Signature Financial Group* 149 F. 3d 1368 (Fed. Cir. 1998).

²¹ See, e.g., Executive Office of the President, *Patent Assertion and U.S. Innovation* (2013), p. 5.

²² *Mayo Collaborative Servs v Prometheus Labs Inc* 132 S. Ct 1289 (2012) (*Mayo*); *Alice Corp v CLS Bank International* 134 S. Ct 2347 (2014) (*Alice*).

²³ 2008 Report, p. 8.

manufacturers marketing slightly different versions of the same automobile in multiple jurisdictions), internet weather data platforms (e.g. providing weather data to users in multiple jurisdictions), mapping technologies (e.g. in which users from multiple jurisdictions access mapping data from a database), etc. Most reasonable practitioners would argue that the subject-matter eligibility threshold should be kept high to prevent the patentability of such an invention, even if it satisfies the other requirements for patentability, such as novelty and inventive step.²⁴

At another extreme, a CI invention may involve, at a much lower level of abstraction, an improved computer-controlled process for curing rubber using a new temperature profile for the curing that leads to stronger and more flexible rubber end-product. Assuming the novelty and inventive step requirements are satisfied, the inventor may seek a patent directed to a computer-controlled process for curing the rubber according to the new temperature profile. Many reasonable practitioners would agree that such an invention should be patentable, and that the subject-matter eligibility rules should not bar a patent in such a case.²⁵

There is a vast array of potential CI inventions that lie between these two extremes, and it is difficult to articulate a succinct legal rule that would coherently demarcate a borderline of patentability that would be acceptable to most reasonable practitioners.²⁶

Statutory basis for subject-matter eligibility in EPO law and in the US

The rules for subject-matter eligibility in both the EPO and in the US are based on statutory provisions. However, these statutory provisions are not sufficiently specific to resolve most disputes involving questions of subject-matter eligibility.

The EPO applies the rule for subject-matter eligibility that is set forth in art.52 of the European Patent Convention (EPC):

“Article 52 Patentable Inventions

- (1) European patents shall be granted for any inventions, in all fields of technology, provided that they are new, involve an inventive step and are susceptible of industrial application.
- (2) The following in particular shall not be regarded as inventions within the meaning of paragraph 1:

- (a) discoveries, scientific theories and mathematical methods;
 - (b) aesthetic creations;
 - (c) schemes, rules and methods for performing mental acts, playing games or doing business, and programs for computers;
 - (d) presentations of information.
- (3) Paragraph (2) shall exclude the patentability of the subject-matter or activities referred to therein only to the extent to which a European patent application or European patent relates to such subject-matter or activities as such.”

Thus, EPC art.52(2)(c) specifies that “programs for computers” shall not be regarded as inventions for which a patent can be granted. However, art.52(3) excludes the patentability of the computer program subject-matter or activities “only to the extent to which a European patent application or European patent relates to such subject-matter or activities as such”. The general nature of the exclusion, and the use of the vague term “as such” in the carve-out from exclusion in art.52(3), have left it open for the EPO Boards of Appeal to interpret the breadth of the carve-out from the exclusion.

Section 101 of US patent law (set forth at 35 USC §101) even more generally specifies that

“[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title”.

This has led the courts and the USPTO, and most significantly, the US Supreme Court, to interpret the breadth of patent eligible subject-matter based on this statutory language. The Supreme Court had earlier established that laws of nature, natural phenomena, and abstract ideas are not patentable subject-matter under §101.²⁷ Because of this, and given the nature of computer programs, the subject-matter eligibility of CI inventions has usually been considered in relation to the exclusion of abstract ideas from patentability.

The inventive step requirement for patentability

Nearly all patent systems, including those of the EPO and the US, separately require that a patentable invention be both new and have inventive step.²⁸ Although inventive

²⁴ See, e.g., *Gottschalk v Benson* 409 U.S. 63 (1972). In this case, the US Supreme Court found that an invention to a process implementing a mathematical algorithm was not patentable because “the patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself”: 71–72.

²⁵ See, e.g., *Diamond v Diehr* 450 U.S. 175 (1981) (finding that the use of an algorithm to control the carrying out of a physical process did not preclude patentability of the invention).

²⁶ For example, under the currently applicable rules for subject-matter eligibility in the US, a graphical user interface invention comprising the steps of (1) monitoring the boundaries of two displayed windows, and (2) automatically relocating textual information in one of the windows upon detecting an overlap of the windows is likely subject-matter eligible. USPTO, *July 2015 Update: Subject Matter Eligibility*, Appendix 1: Examples (30 July 2015), p.7. The same invention is likely not to be patentable under the subject-matter eligibility rules of the European Patent Office. See, e.g., T1562/11 *Closing out white space/SAP* (EPO Bd Appeal, 3 June 2015), <https://www.epo.org/law-practice/case-law-appeals/recent/t111562eu1.html> [Accessed 1 June 2017].

²⁷ *Diamond v Diehr*, 450 U.S. 175, 185 (1981).

²⁸ See, e.g., EPC arts 54, 56; 35 USC §§102, 103.

step, like novelty, is a requirement for patentability that is distinct from subject-matter eligibility, the EPO's manner of determining subject-matter eligibility for CI inventions overlaps with its inventive step requirement. The current law on subject-matter eligibility in the US also partially invokes notions that are part of the novelty and inventive step inquiries, although not as formally as in the EPO. For that reason, this article briefly discusses these requirements for patentability.

The requirement that an invention be new to be patentable (i.e. the novelty requirement), reflects the commonsensical notion that exclusivity should not be granted to an inventor who has not invented something new. Generally speaking, a patent office will reject a claim in a patent application on the basis of lack of novelty if the patent office is able to identify a single piece of prior art (e.g. an earlier product or process, an earlier article or a patent or published application with an earlier priority date) that discloses all features of the invention set forth in that claim. Similarly, a court handling a patent challenge may decide that a claim in an issued patent is invalid based on such a finding.

The inventive step requirement is assessed by determining, having regard to the state of the art at the time of filing of the patent application being examined, whether the invention would have been obvious to a person skilled in the art.²⁹ Because of the broad-ranging and general nature of this inquiry, the EPO has developed a specific formalism, called “the problem-solution approach”, for determining whether an invention satisfies the inventive step requirement.³⁰ In this approach:

1. first determine the closest, i.e. most relevant, prior art to the invention, and then determine the differences between that closest prior art and the invention;
2. determine, with respect to the closest prior art, the objective technical problem that the invention solves, i.e. determine the technical effect brought about by the differences between the closest prior art and the invention, and
3. determine whether the invention's solution to the objective technical problem would be obvious to the person of ordinary skill in the technology area (i.e. art) concerned.

How this formalism is applied in practice is discussed further below in connection with a particular example.

The subject-matter eligibility requirement for patentability in EPO law

The requirement of technical character

The case law of the Technical Board of Appeal generally requires that a patentable invention have “technical character”.³¹ The technical character threshold for patentability has fluctuated somewhat in the case law of the Technical Board of Appeal, and related terms and concepts such as “technical contribution”, “technical effect”, “further technical effect” and “technical consideration” have been employed as part of the technical character inquiry from time to time. However, the current practice of the Technical Board of Appeal (and more generally of the EPO), is to impose a relatively low technical character threshold for most CI inventions. For example, the Board has found the following inventions to have the requisite technical character for patentability:

- processing information using a conventional computer programmed in a specific way to carry out a computerised translation process provided a technical aspect (and thus conferred technical character) to non-technical things such as dictionaries, word matching or the translation of compound expressions into a corresponding meaning³²;
- a computer-implemented method including mathematical steps for simulating the performance of a circuit subject to a particular noise profile³³;
- 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. The relevant method was part of a claim directed to a computer program stored on a computer-readable storage medium³⁴;
- 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

²⁹ See, e.g., EPC art.56.

³⁰ See, e.g., *Case Law of the Boards of Appeal of the European Patent Office*, 7th edn (September 2013), section I.D., http://www.epo.org/law-practice/legal-texts/html/caselaw/2013/e/clr_i_d.htm [Accessed 13 June 2017].

³¹ See, e.g., T 0931/95 (*Controlling pension benefits system*) (EPO Bd Appeal, 8 September 2000), <https://www.epo.org/law-practice/case-law-appeals/recent/t950931ep1.html>; T 1173/97 (*Computer program product/IBM*) (EPO Bd Appeal, 1 July 1998), <https://www.epo.org/law-practice/case-law-appeals/recent/t971173ex1.html>; T 0935/97 (*Computer program product II/IBM*) (EPO Bd Appeal, 4 February 1999), <http://www.epo.org/law-practice/case-law-appeals/recent/t970935eu1.html> [All accessed 1 June 2017].

³² T 1177/97 (*Translating natural languages/SYSTRAN*) (EPO Bd Appeal, 9 July 2002), <https://www.epo.org/law-practice/case-law-appeals/recent/t971177eu1.html> [Accessed 1 June 2017].

³³ T 1227/05 (*Circuit simulation I/Infineon Technologies*) (EPO Bd Appeal, 13 December 2006), <https://www.epo.org/law-practice/case-law-appeals/recent/t051227ep1.html> [Accessed 1 June 2017].

³⁴ T 0424/03 (*Clipboard formats I/MICROSOFT*) (EPO Bd Appeal, 23 February 2006), <http://www.epo.org/law-practice/case-law-appeals/recent/t030424eu1.html> [Accessed 1 June 2017].

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 invoked.³⁵

In particular, the more recent decisions of the EPO Boards of Appeal state that a CI invention claim can avoid exclusion under art.52(2)(c) and (3) EPC merely by expressly reciting the use of a computer, a computer network or a computer readable storage medium, because these elements have technical character.³⁶

On the other hand, the EPO appears to apply a stricter rule when the patent claim is directed to a “computer program” (e.g. as opposed to either of (1) a method claim to a CI invention that does not directly recite a computer program, but whose steps are or can be carried out by a computer; or (2) a computer-readable medium storing a computer program, which when executed by a processor, carries out a certain functionality). In particular, in this case, the computer program must be

“capable of bringing about, when running on or loaded on a computer, a further technical effect going beyond the ‘normal’ physical interactions between the program (software) and the computer (hardware) on which it is run”.³⁷

Additionally, although all computer programming involves technical considerations to some degree, such technical considerations may confer a technical character on the invention only if there were technical programming considerations beyond merely finding a computer algorithm to carry out the relevant functionality.³⁸ Control of an industrial process, the internals of the computer program that affect the efficiency or security of a process, management of the required computer resources, or data transfer rates of the communication link are aspects that may lead to a finding of a further technical effect.³⁹

The interaction between the subject-matter eligibility requirement and the inventive step requirement

As discussed above, in patents directed to CI inventions, where the claim is not directed to a computer program, the EPO’s formal requirements for subject-matter eligibility appear to impose a relatively low threshold. However, the EPO has partially conflated the subject-matter eligibility requirement and the inventive step requirement by separately and additionally requiring that any non-technical feature of the invention, in other words, any feature of the invention that is excluded from patentability under art.52(2) and (3) of the EPC, is not to be taken into account in assessment of inventive step (unless there is some interaction between technical and non-technical features in solving a technical problem).

For example, if the inventive step of the claim resides only in the presentation of visual data on a graphical user interface to the user, the EPO has stated that this feature cannot on its own confer inventive step to the claimed invention, because it is not a technical feature given the exclusion in EPC art.52(2)(d) of presentations of information.⁴⁰ In a relevant case, the invention was a system and method for accessing data files in a computer-based database involving representing the files as elements on the display for user selection.⁴¹ The EPO found that the invention did not

“solve a problem that is directly concerned with the search for and retrieval of information, since the only new feature relates to the movement of displayed elements”.⁴²

Further, the user’s selection of an element corresponding to a file was merely “a mental act”. For that reason, the EPO failed to find any technical features that contributed to inventive step, and found the invention unpatentable for lacking inventive step.⁴³

Thus, the inventive step requirement at the EPO is not entirely independent of the inquiry into subject-matter eligibility, and part of the work of the subject-matter eligibility criterion has been effectively offloaded to the inventive step requirement.

³⁵ T 1194/97 (*Data structure product/PHILIPS*) (EPO Bd Appeal, 15 March 2000), <https://www.epo.org/law-practice/case-law-appeals/recent/t1194ex1.html> [Accessed 1 June 2017].

³⁶ See, e.g., G-3/08, *Programs for Computers* [2010] O.J.E.P.O 17 (EPO Enlarged Bd Appeal, 12 May 2010), [http://documents.epo.org/projects/babylon/eponet.nsf/0/DC6171F182D8B65AC125772100426656/\\$File/G3_08_Opinion_12_05_2010_en.pdf](http://documents.epo.org/projects/babylon/eponet.nsf/0/DC6171F182D8B65AC125772100426656/$File/G3_08_Opinion_12_05_2010_en.pdf); Guidelines for Examination in the European Patent Office, Part G, EPO Guidelines for Patentability, Ch.II-3.6 (November 2015), <http://www.epo.org/law-practice/legal-texts/html/guidelines/e/index.htm> [Both accessed 1 June 2017].

³⁷ See, e.g., G-3/08, *Programs for Computers* [2010] O.J.E.P.O 17 (12 May 2010), [http://documents.epo.org/projects/babylon/eponet.nsf/0/DC6171F182D8B65AC125772100426656/\\$File/G3_08_Opinion_12_05_2010_en.pdf](http://documents.epo.org/projects/babylon/eponet.nsf/0/DC6171F182D8B65AC125772100426656/$File/G3_08_Opinion_12_05_2010_en.pdf); Guidelines for Examination in the European Patent Office, Part G, EPO Guidelines for Patentability, Ch.II-3.6 (November 2015), <http://www.epo.org/law-practice/legal-texts/html/guidelines/e/index.htm> [Both accessed 1 June 2017].

³⁸ See, e.g., G-3/08, *Programs for Computers* [2010] O.J.E.P.O 17 (12 May 2010), [http://documents.epo.org/projects/babylon/eponet.nsf/0/DC6171F182D8B65AC125772100426656/\\$File/G3_08_Opinion_12_05_2010_en.pdf](http://documents.epo.org/projects/babylon/eponet.nsf/0/DC6171F182D8B65AC125772100426656/$File/G3_08_Opinion_12_05_2010_en.pdf); Guidelines for Examination in the European Patent Office, Part G, EPO Guidelines for Patentability, Ch.II-3.6 (November 2015), <http://www.epo.org/law-practice/legal-texts/html/guidelines/e/index.htm> [Both accessed 1 June 2017].

³⁹ See, e.g., G-3/08, *Programs for Computers* [2010] O.J.E.P.O 17 (12 May 2010), [http://documents.epo.org/projects/babylon/eponet.nsf/0/DC6171F182D8B65AC125772100426656/\\$File/G3_08_Opinion_12_05_2010_en.pdf](http://documents.epo.org/projects/babylon/eponet.nsf/0/DC6171F182D8B65AC125772100426656/$File/G3_08_Opinion_12_05_2010_en.pdf); Guidelines for Examination in the European Patent Office, Part G, EPO Guidelines for Patentability, Ch.II-3.6 (November 2015), <http://www.epo.org/law-practice/legal-texts/html/guidelines/e/index.htm> [Both accessed 1 June 2017].

⁴⁰ T 1562/11 (*Closing out white space/SAP*) (3 June 2015), <https://www.epo.org/law-practice/case-law-appeals/recent/t11562eu1.html> [Accessed 1 June 2017].

⁴¹ T 1143/06 (*Data selection system/BRITISH TELECOMMUNICATIONS*) (EPO Bd Appeal, 1 April 2009), <https://www.epo.org/law-practice/case-law-appeals/recent/t061143eu1.html> [Accessed 1 June 2017].

⁴² T 1143/06 (*Data selection system/BRITISH TELECOMMUNICATIONS*) (1 April 2009), <https://www.epo.org/law-practice/case-law-appeals/recent/t061143eu1.html> [Accessed 1 June 2017].

⁴³ T 1143/06 (*Data selection system/BRITISH TELECOMMUNICATIONS*) (1 April 2009), <https://www.epo.org/law-practice/case-law-appeals/recent/t061143eu1.html> [Accessed 1 June 2017].

The *Hitachi* decision

A good example of how the subject-matter eligibility criterion and inventive step requirement interact in EPO case law is provided by the *Hitachi* decision of the EPO Technical Board of Appeal.⁴⁴ The relevant invention was directed to a computer-implemented method for carrying out an automatic auction. The main claim at issue in the case was as follows:

- “1. An automatic auction method executed in a server computer comprising the steps of:
- a) transmitting information on a product to be auctioned to a plurality of client computers via a network, each client computer belonging to a bidder;
 - b) receiving a plurality of auction ordering information pieces, each including a desired price and a maximum price in competitive state, for purchase of said product, from the plurality of client computers via the network;
 - c) storing the received auction ordering information pieces in the server computer for respective bidders;
 - d) setting an auction price;
 - e) determining whether there is any bidder who proposes a desired price equal to or higher than the auction price using the auction ordering information pieces stored in the server computer;
 - f) if there is no bidder in the step e), lowering the auction price, and repeating the step e);
 - g) if there is more than one bidder at step e), judging whether there is more than one bidder for whom the auction price is less than or equal to the desired price such that a competitive state occurs using the auction ordering information pieces stored in the server computer;
 - h) if the competitive state occurs, increasing the auction price by a predetermined value;
 - i) excluding the bidder who proposes acceptable a price lower than the increased auction price and

specifying the other bidder or bidders using the auction ordering information;

- j) judging whether the competitive state occurs among the bidder or bidders specified in the step i);
- k) repeating the steps h), i) and j) and determining the remaining bidder as a successful bidder when there is no competitive state at step j; and
- l) if no competitive state occurs in the step g), determining the remaining bidder as a successful bidder.”

Claim 3, which was also at issue, was directed to a “computerized auction apparatus for performing an automatic auction via a network, among a plurality of bidders, the bidders using a corresponding plurality of client computers”, the apparatus comprising means for performing the steps set out in claim 1. The description section of the patent application discloses computer means for carrying out the disclosed invention.⁴⁵

In assessing subject-matter eligibility, the Board first considered claim 3. It found that because this claim included technical features such as a “server computer”, “client computers” and a “network”, it satisfied the subject-matter eligibility criterion of art.52(1) EPC.⁴⁶ The Board further noted that claim 1, even though it was directed to a method (as opposed to an apparatus as in claim 3), satisfied the subject-matter eligibility criteria for the same reason.⁴⁷

The Board, however, found none of the claims patentable owing to lack of inventive step. In the inventive step inquiry, the Board considered the applicant’s assertion that the invention solved the problem in the prior art of delays in propagation of information between the bidders and the server. The Board found that the closest prior art disclosed an online auction system in which the timing of bids made was included in information sent to the central server handling the auction (or, alternatively, in which a delay was imposed at the client’s computer in transmitting the bid to the central server to achieve synchronisation among bids that were made).⁴⁸ The Board further found that the subject invention solved the propagation delay problem by adapting the auction method such that it could be performed automatically (by transmission of both the bidder’s desired price and the bidder’s maximum price) without consideration of timing information of the bids that were made.⁴⁹ However, the Board stated:

⁴⁴ T 0258/03 (*Auction method/HITACHI*) (EPO Bd Appeal, 21 April 2004), <https://www.epo.org/law-practice/case-law-appeals/recent/t030258ex1.html> [Accessed 1 June 2017] (*Hitachi*).

⁴⁵ See, e.g., European patent application EP0828223 at col.5, lines 6–46.

⁴⁶ *Hitachi*, para.?? (21 April 2004), <https://www.epo.org/law-practice/case-law-appeals/recent/t030258ex1.html> [Accessed 1 June 2017].

⁴⁷ *Hitachi*, para.?? (21 April 2004), <https://www.epo.org/law-practice/case-law-appeals/recent/t030258ex1.html> [Accessed 1 June 2017].

⁴⁸ *Hitachi*, para.5.2 (21 April 2004), <https://www.epo.org/law-practice/case-law-appeals/recent/t030258ex1.html> [Accessed 1 June 2017].

⁴⁹ *Hitachi*, para.5.6 (21 April 2004), <https://www.epo.org/law-practice/case-law-appeals/recent/t030258ex1.html> [Accessed 1 June 2017].

“In the Board’s view, however, this solution does not contribute to a technical character and cannot therefore be taken into account for assessing inventive step since it concerns the rules of the auction, i.e. it is not a technical solution to the delay problem described (and solved by technical means) [in the cited prior art references], but a solution entirely based on modifications to the auction method. Method steps consisting of modifications to a business scheme and aimed at circumventing a technical problem rather than solving it by technical means cannot contribute to the technical character of the subject matter claimed.”⁵⁰

The Board found that the other, technical features of the invention, such as the data transmission and storage features (e.g. steps (b) and (c) of claim 1) were standard features which were known in the prior art; thus, they

also did not confer inventive step on the invention. Based on these considerations, the Board found that none of the claims at issue satisfied the inventive step criterion.⁵¹

EPO guidance

The EPO, in addition to publishing the case law of its Boards of Appeal, also provides guidance materials on patentability, including subject-matter eligibility for CI inventions.⁵²

The EPO is also a resource for other materials relating to the patentability of CI inventions. The following flowchart in Figure 1 summarises the steps in determining the patentability of an invention, and, in particular, a CI invention at the EPO. The flowchart depicts, in addition to the subject-matter eligibility and inventive step inquiries as discussed earlier, the novelty requirement for patentability.

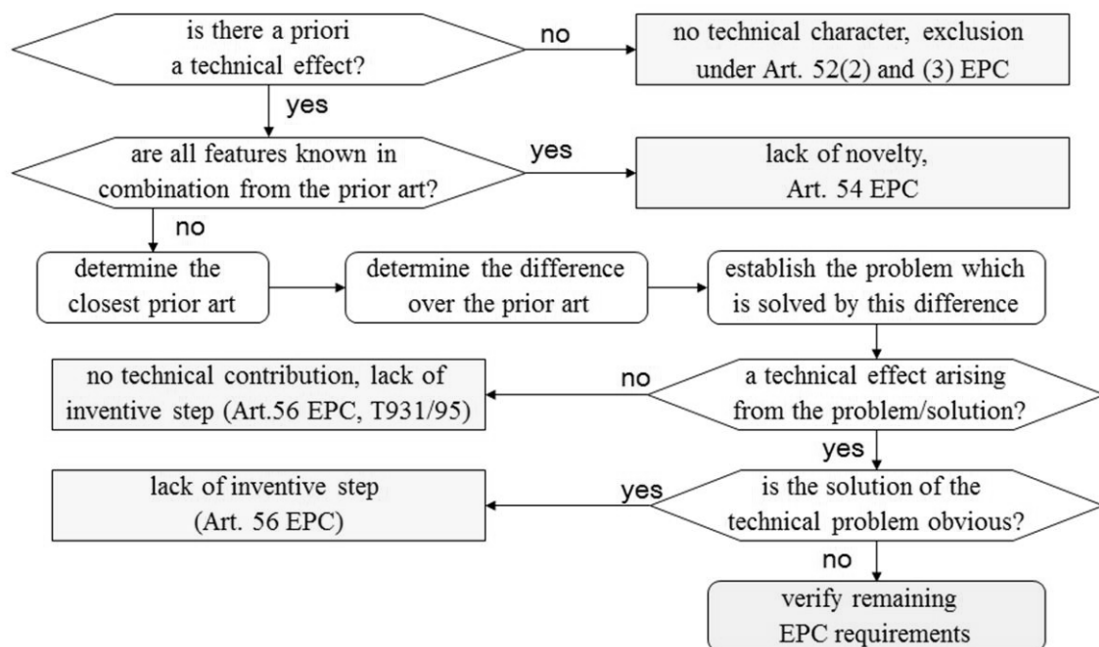


Figure 1 Determining the patentability of an invention⁵³

The subject-matter eligibility requirement for patentability in the US

The Alice case and the Mayo framework

The US Supreme Court had by the early 1980s established that laws of nature, natural phenomena and abstract ideas are not patentable subject-matter under Section §101.⁵⁴ Additionally, as discussed earlier, a liberal phase of subject-matter eligibility for CI inventions that began in

1998 ended with a string of Supreme Court decisions beginning in 2010.⁵⁵ In particular, these decisions overturned a relatively low-threshold methodology that had been developed by the US Court of Appeals for the Federal Circuit (Fed. Cir.) for assessing the subject-matter eligibility of CI inventions. Although the new formalism set forth by the Supreme Court was first enunciated in the *Mayo* case in the context of the subject-matter eligibility of an invention that invoked a law of nature, it was first applied by the Supreme Court in the context of CI inventions in the *Alice* case (the *Mayo* framework).

⁵⁰ *Hitachi*, para.5.7 (21 April 2004), <https://www.epo.org/law-practice/case-law-appeals/recent/t030258ex1.html> [Accessed 1 June 2017].

⁵¹ *Hitachi*, para.5.7 (21 April 2004), <https://www.epo.org/law-practice/case-law-appeals/recent/t030258ex1.html> [Accessed 1 June 2017].

⁵² See, e.g., Guidelines for Examination in the European Patent Office, Part G, EPO Guidelines for Patentability (November 2015), <http://www.epo.org/law-practice/legal-texts/html/guidelines/e/index.htm> [Accessed 1 June 2017].

⁵³ Source: G. Herreman, Patentability of Computer-Implemented Inventions, European Patent Office (Discussion Workshop on Understanding the CII Directive 2005) at slide 24.

⁵⁴ *Diamond v Diehr* 450 U.S. 175, 185 (1981).

⁵⁵ *Alice Corp v CLS Bank International* 134 S. Ct 2347 (2014); *Mayo Collaborative Servs v Prometheus Labs* 132 S. Ct 1289 (2012); *Bilski v Kappos* 561 U.S. 593 (2010).

The inventions in the *Alice* case involved electronic methods for financial-trade systems that mitigated settlement risk, which is the risk that a party to contractual financial exchange will not satisfy its obligation.⁵⁶ In these inventions, a properly programmed computer acts as a third-party intermediary that creates shadow credit and debit records that mirror the balances in the parties' actual accounts at financial institutions such as banks.⁵⁷ The intermediary updates these shadow records in real time as transactions are initiated, and allows only those transactions for which the parties' updated shadow records indicate sufficient resources to satisfy their mutual obligations.⁵⁸ By directing the financial institutions accordingly, the intermediary mitigates the risk that only one of the parties performs its obligations.⁵⁹

In reaching the decision, the Supreme Court first considered whether the invention was directed to an abstract idea excluded from subject-matter eligibility pursuant to the earlier Supreme Court decision in *Diehr*.⁶⁰ The Supreme Court found that it was, because the relevant claims were drawn to the concept of intermediated settlement, which is "a fundamental economic practice long prevalent in our system of commerce".⁶¹ In so doing, the Supreme Court looked to and cited references including academic business publications describing intermediated settlement as a building block of the modern economy.⁶²

After the first step in the *Mayo* framework of assessing whether the invention is directed to an abstract idea, the court considered the second step, which involves determining whether the invention comprises an inventive concept sufficient to transform the claimed abstract idea into a patent-eligible application. According to the Supreme Court, to be patentable the claim directed to an abstract idea must include "additional features" to ensure "that the claim is more than a drafting effort designed to monopolize the abstract idea".⁶³ The Supreme Court in this step found that the mere recitation of a generic computer to carry out the relevant functionality "cannot transform a patent-ineligible abstract idea into a patent-eligible invention".⁶⁴ Further, neither mere application, without more, of the abstract idea, nor limiting the use of the abstract idea to a particular technological environment was sufficient to render the

claimed invention patent eligible.⁶⁵ These findings of the Supreme Court were based on its concern that patent eligibility in these circumstances would allow the monopolisation of the abstract idea, i.e. pre-emption of use of the idea in a vast array of technology areas.⁶⁶

In considering the relevant elements of the claimed invention in the second step of the *Mayo* framework, the Supreme Court in particular found that functionalities such as electronic recordkeeping, obtaining data, adjusting account balances and issuing automated instructions are "well-understood, routine, conventional activities previously known to the industry".⁶⁷ These functionalities, according to the Supreme Court, were generic computer functions that could not confer subject-matter eligibility upon the claimed abstract invention.⁶⁸ Further, the court found that considering these components as a whole rather than separately did not add anything further.⁶⁹ Based on the invention's failure to pass the second step of the *Mayo* framework, the Supreme Court found the invention to not be subject-matter eligible.⁷⁰

USPTO Guidance

The USPTO has provided guidance for applicants for CI inventions following the *Alice* decision.⁷¹ The guidance is based on the *Mayo* framework and in this respect closely follows the reasoning of the *Alice* decision. As shown in Figure 2, the only difference from the *Mayo* framework as discussed in *Alice* is the additionally preliminary step of determining whether the claim being examined is directed to a "process, machine, manufacture, or composition of matter" as specified in 35 USC §101. Based on this step, a claim directed to a transitory signal (e.g. an electronic or electromagnetic signal encoded with certain information), for example, would not be subject-matter eligible, because it would not be covered by any of the categories articulated in §101.

In connection with the USPTO's second step of determining whether the invention is directed to an abstract idea, the USPTO guidance indicates that a USPTO examiner should refer to "the body of case law precedent in order to identify abstract ideas by way of comparison to concepts already found to be abstract".⁷² In particular, the guidance indicates that "a claimed concept [not be] identified as an abstract idea unless it is

⁵⁶ *Alice* 134 S. Ct 2347, 2351–2352 (2014).

⁵⁷ *Alice* 134 S. Ct 2347, 2352 (2014).

⁵⁸ *Alice* 134 S. Ct 2347, 2352 (2014).

⁵⁹ *Alice* 134 S. Ct 2347, 2352 (2014).

⁶⁰ *Diamond v Diehr* 450 U.S. 175 (1981) (finding that the use of an algorithm to control the carrying out of a physical process did not preclude patentability of the invention).

⁶¹ *Alice* 134 S. Ct 2347, 2356 (2014).

⁶² *Alice* 134 S. Ct 2347, 2356 (2014).

⁶³ *Alice* 134 S. Ct 2347, 2357 (2014).

⁶⁴ *Alice* 134 S. Ct 2347, 2358 (2014).

⁶⁵ *Alice* 134 S. Ct 2347, 2358 (2014).

⁶⁶ *Alice* 134 S. Ct 2347, 2358 (2014).

⁶⁷ *Alice* 134 S. Ct 2347, 2359 (2014).

⁶⁸ *Alice* 134 S. Ct 2347, 2359 (2014).

⁶⁹ *Alice* 134 S. Ct 2347, 2359–2360 (2014).

⁷⁰ *Alice* 134 S. Ct 2347, 2360 (2014).

⁷¹ USPTO, 2014 Interim Guidance on Patent Subject Matter Eligibility, 79 Fed. Reg. 74,618 (2014) (Interim Guidance); Examples: Abstract Ideas (27 January 2015), http://www.uspto.gov/patents/law/exam/abstract_idea_examples.pdf (Examples); July USPTO, 2015 Update: Subject Matter Eligibility, Appendix 1: Examples (30 July 2015), <http://www.uspto.gov/patent/laws-and-regulations/examination-policy/2014-interim-guidance-subject-matter-eligibility-0> (Update) [Both accessed 1 June 2017].

⁷² USPTO, Update (30 July 2015), p.3.

similar to at least one concept that the courts have identified as an abstract idea.”⁷³ Accordingly, the guidance indicates that the following categories have been found to invoke abstract ideas:

- fundamental (foundational) economic practices (e.g. inventions directed to agreements between people in the form of contracts, legal obligations and business relations);
- certain methods of organising human activity (e.g. managing relationships or transactions between people, social activities, human behaviour, satisfying or avoiding legal obligations, advertising, marketing and sales activities and managing human mental activity);
- an idea of itself (e.g. an idea standing alone, such as uninstantiated concepts, plans or schemes, mental processes that can be carried out in the human mind or by a

human using paper and pencil, such as organising information, data recognition, comparing and/or collecting information); and

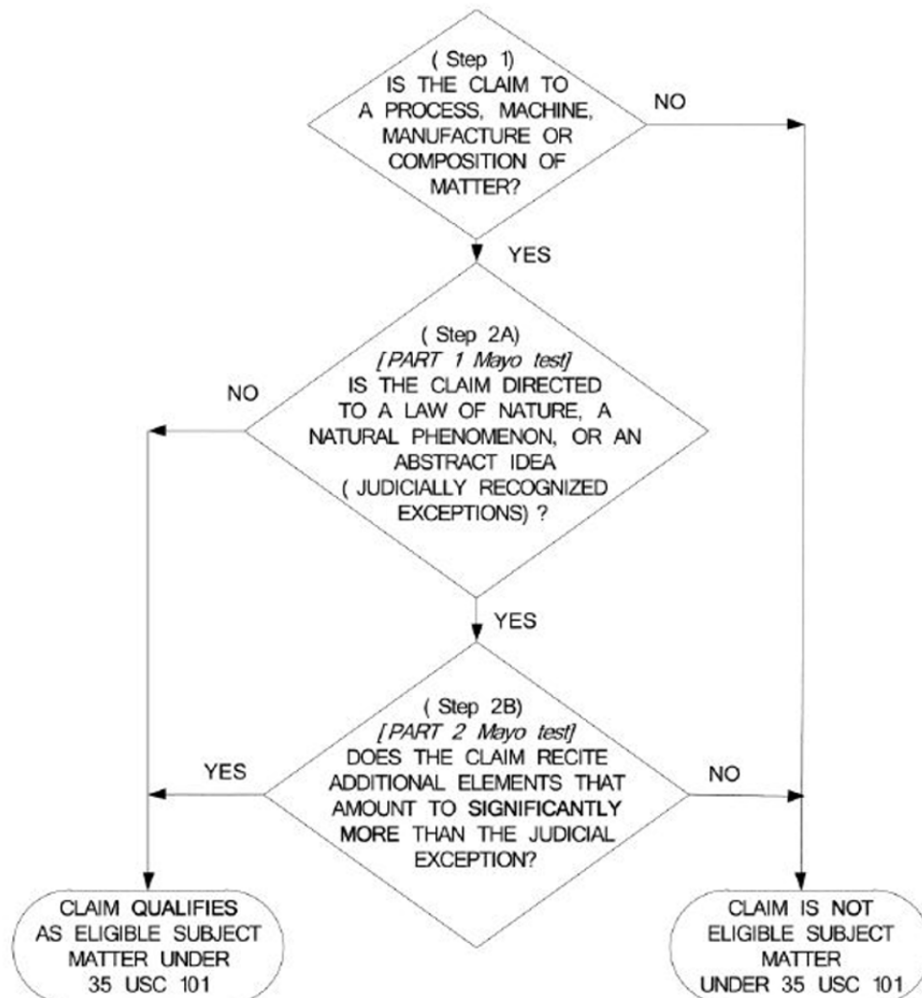
- mathematical relationships/formulas (e.g. mathematical algorithms, relationships, formulas, calculations, such as converting data from one numerical system to another, a formula for calculating an alarm limit, a formula for describing an electromagnetic wave, a mathematical formula for hedging, managing a life insurance policy by performing calculations, reducing the amount of calculations in known computations, determining the optimal number of visits by a business representative to a client, computing a price for the sale of a fixed income asset, calculating the difference between local and average data values).⁷⁴

⁷³ USPTO, *Update* (30 July 2015), p.3.

⁷⁴ USPTO, *Update* (30 July 2015), pp.4–5.

SUBJECT MATTER ELIGIBILITY TEST FOR PRODUCTS AND PROCESSES

PRIOR TO EVALUATING A CLAIM FOR PATENTABILITY, ESTABLISH THE
BROADEST REASONABLE INTERPRETATION OF THE CLAIM.
ANALYZE THE CLAIM AS A WHOLE WHEN EVALUATING FOR PATENTABILITY.



IN ACCORDANCE WITH COMPACT PROSECUTION, ALONG WITH DETERMINING ELIGIBILITY, ALL CLAIMS ARE TO BE FULLY EXAMINED UNDER EACH OF THE OTHER PATENTABILITY REQUIREMENTS: 35 USC §§ 102, 103, 112, and 101 (UTILITY, INVENTORSHIP, DOUBLE PATENTING) AND NON- STATUTORY DOUBLE PATENTING.

Notable changes from prior guidance:

- All claims (product and process) with a judicial exception (any type) are subject to the same steps.
- Claims including a nature-based product are analyzed in Step 2A to identify whether the claim is directed to (recites) a "product of nature" exception. This analysis compares the nature-based product in the claim to its naturally occurring counterpart to identify markedly different characteristics based on structure, function, and/ or properties. The analysis proceeds to Step 2B only when the claim is directed to an exception (when no markedly different characteristics are shown) .

Figure 2 USPTO Guidance figure on subject-matter eligibility⁷⁵

The USPTO guidance includes examples of application of its *Mayo* framework based on examples from case law as well as several hypothetical examples. For example, the USPTO guidance includes the following (all of which

were found to satisfy the USPTO's first step of determining whether the claim recites a process, machine, manufacture, or composition of matter)

⁷⁵ USPTO, *Interim Guidance*, 79 Fed. Reg. 74,618 at 74,621.

Claimed invention	Abstract idea?	Additional elements amounting to significantly more than the judicial exception?	Subject-matter eligible	Source of example
<i>Graphical user interface inventions</i>				
A method claim of a graphical user interface invention in which the recited elements include: • monitoring the boundaries of two displayed windows, and • automatically relocating textual information in one of the windows upon detecting an overlap of the windows.⁷⁶	No; “the claimed method is necessarily rooted in computer technology to overcome a problem specifically arising in graphical user interfaces	Not relevant	Yes	Hypothetical example
Same invention as above, but where the claim merely recites calculating a scaling factor (which presumably could be used to relocate and redraw one of the windows upon an overlap) ⁷⁷	Yes, because it is merely directed to mathematical algorithm	No, the body of the claim recites no additional limitations, and the preamble, which recites that the claimed process is used in a graphical user interface environment, only states a field of use limitation that does not limit the scope of the claim	No	Hypothetical example
<i>Internet-based business method inventions</i>				
A method directed to distributing stock quotes over a network in which: • stock quotes are received at a server, • the stock quotes are filtered by comparing to user-specified values, • a stock-quote alert is generated based on the filtering, and • a stock quote is transmitted to the subscriber’s computer.⁷⁸	Yes, because the steps involve merely the organisation and comparison of data which can be performed mentally and is an idea of itself	No, the server is recited at a high level of generality and most broadly only requires a generic computer carrying out generic functions. Limitations directed to the Internet are simply a field of use limitation that is not sufficient. Viewed either individually or collectively, the limitations do not add anything “significantly more”.	No	<i>Google, Inc v Simpleair Inc</i> , CBM Case no. CBM 2014-00170 (22 January 2015)
Same invention as above, but where the claim also recites: • transmission of the alert wirelessly to the subscriber’s wireless device, • displaying the alert on the wireless device, and • enabling connection to the data source over the Internet when the wireless device becomes locally connected to the subscriber’s computer.⁷⁹	Yes, for the reason set forth above.	Yes, because when the following additional limitations are considered as a whole: • using a microprocessor and memory, • transmission of data over a data channel to a wireless device, • displaying the alert, and • connecting the subscriber to the data source over the internet, the invention is significantly more than simply organising and comparing data. The invention addresses the internet-centric challenge of alerting a subscriber with time sensitive information when the subscriber’s computer is offline.	Yes	<i>Google Inc v Simpleair Inc</i> , CBM Case no. CBM 2014-00170 (22 January 2015)

⁷⁶ USPTO, *Update* (30 July 2015), Appendix 1, pp.7–12.

⁷⁷ USPTO, *Update* (30 July 2015), Appendix 1, pp.7–12.

⁷⁸ USPTO, *Update* (30 July 2015), Appendix 1, pp.1–5.

⁷⁹ USPTO, *Update* (30 July 2015), Appendix 1, pp.1–5.

Claimed invention	Abstract idea?	Additional elements amounting to significantly more than the judicial exception?	Subject-matter eligible	Source of example
The invention is directed to solve the problem of an internet user being directed away from a host web page when the user clicks on an ad displayed on the host web page. In the invention, when the user clicks on the ad, the user is served a web page that is a composite of the host web page and the ad web page. The user, in this way, is served the desired ad-related information in a manner that retains the look and feel of the host's web page. The relevant claim recites a computer system that includes a computer store and computer serve that carry out steps implementing this functionality. ⁸⁰	No, because the claim does not recite any of a mathematical algorithm, fundamental economic or longstanding commercial practice, and instead addresses an internet-centric business challenge of retaining website visitors. The invention is necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks. No idea similar to those previously found by the courts to be abstract has been identified in the claim.	Not relevant	Yes	<i>DDR Holdings LLC v Hotels.com LP</i> 773 F. 3d 1245 (Fed. Cir. 2014)

Regarding the third step—relating to determining whether the claim recites additional elements that amount to significantly more than the judicial exception—the USPTO guidance similarly does not set forth a methodology for the determination, but rather provides examples of when a finding of “significantly more” may be made:

- improvements to another technology or technical field (e.g. a mathematical formula applied in a process for curing rubber);
- improvements to the function of the computer itself (e.g. reducing memory usage, faster computation time, etc.);
- applying the judicial exception with or by a particular machine (i.e. other than a generic computer);
- transforming or reducing an article to a different state or thing (e.g. transforming raw rubber into cured rubber using a mathematical algorithm to control the curing process);
- adding a specific limitation other than what is well understood, routine and conventional in the field, or adding unconventional steps that confine the claim to particular useful application; and
- other meaningful limitations beyond generally linking the use of the judicial exception to a particular technological environment.⁸¹

On the other hand, the USPTO guidance indicates that the following do not allow a finding of the presence of “significantly more” than a judicial exception:

- merely applying the judicial exception, or mere instructions to implement an abstract idea on a computer;
- simply including well-understood and routine, conventional activities previously known to industry at a high level of generality (e.g. using a generic computer to obtain data, adjust account balances, issue automated instructions);
- adding insignificant extra-solution activity to the judicial exception (e.g. adding a data-gathering step, or an ordinary input/output step); and
- merely narrowing the use of the judicial exception to a particular technological environment or field of use (e.g. claiming elements limiting the use of the abstract idea of hedging to the commodities or energy markets).⁸²

Federal Circuit case law in 2016 softening the impact of Alice

Until 2016, the 2014 *DDR Holdings* decision of the Federal Circuit was the only post-*Alice* case in which patent claims were found to be subject-matter eligible.⁸³ At the time of writing of this article, the Federal Circuit in 2016 had decided four other cases in which patent claims were found subject-matter eligible. The rationale and facts of these cases appear to suggest, at least in the view of the Federal Circuit, that the subject-matter eligibility threshold is not as high as a close reading of *Alice* would suggest. In particular, the respective relevant invention in each of these cases comprised general-purpose computing devices that had been

⁸⁰ USPTO, *Examples* (27 January 2015), pp.4–6.

⁸¹ USPTO, *Interim Guidance*, 79 Fed. Reg. 74,618 at 74,624.

⁸² USPTO, *Interim Guidance*, 79 Fed. Reg. 74,618 at 74,624.

⁸³ *DDR Holdings LLC v Hotels.com LP* 773 F. 3d 1245 (2014) (*DDR Holdings*).

programmed in a way that led to subject-matter eligibility. This section of the article reviews *DDR Holdings* and the 2016 Federal Circuit cases finding subject-matter eligible claims.

The *DDR Holdings* case

The claimed invention in *DDR Holdings*, which is a case from 2014, comprised systems and methods of generating a composite web page for e-commerce applications that combined certain visual elements of a host website with content of a third-party merchant.⁸⁴ The user, for example, may be viewing a host website page whose content includes information on a third-party product being advertised on the host website page, as well as a link to the third-party merchant's website. In prior art applications, the user's clicking on the link to the third-party merchant's website would navigate the user interface to that third-party merchant, with no further content of the host website being displayed to the user. The invention, by displaying a composite website, essentially "gives the viewer of the page the impression that she is viewing pages served by the host" website.⁸⁵

The Federal Circuit, without expressly stating that the invention was directed to an abstract idea, found that the claims include an inventive concept sufficient to transform the underlying idea into a patent-eligible application, thus satisfying the second step of the *Mayo* framework. In doing so, the court found that the claims

"do not merely recite the performance of some business practice known from the pre-Internet world along with the requirement to perform it on the Internet. Instead, the claimed solution is necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks".⁸⁶

In particular, the court stated that the invention was not merely the internet analogue of, for example, a vacation-package selling kiosk located within a warehouse store, because the problem of being transported completely away from a host website to a third-party merchant's website did not exist with "brick and mortar" stores.⁸⁷ The court also found that the claims did not attempt to pre-empt every application of the idea of increasing sales by making two web pages look the same. As a result, the court concluded that the relevant claims include "additional features" that ensure that the claims

are "more than a drafting effort designed to monopolize the [abstract idea]".⁸⁸ Thus, the Federal Circuit found that the relevant claims were subject-matter eligible.

The *Enfish* case

The claimed invention in *Enfish* was directed to a logical table, essentially a data structure, that included a "self-referential property".⁸⁹ This property allowed a single table to essentially contain what in prior art contexts would be set forth in different tables containing different numbers of columns and different column entries. This was done by signifying the addition of a new column in the table by adding a new row that acted as a pointer for the new column.⁹⁰ By storing in a single table what would have been set forth in separate prior art tables, the invention allowed faster searching of data and more effective storage of data.⁹¹ The relevant claim did not expressly recite the self-referential property; however, the claim recited "means for configuring", which was interpreted based on 35 USC §112, ¶6 and the disclosure in the specification to comprise the self-referential property.⁹²

The court found that the relevant claims were not directed to an abstract idea, because they were directed to a specific improvement to the way computers operate as embodied in the self-referential table.⁹³ The court expressly stated that the invention's ability to run on a general-purpose computer did not doom the claims.⁹⁴ More importantly, the fact that the improvement to the prior art was not physical also did not doom the claims.⁹⁵ The court also found that the invention did not cover any form of storing tabular data, but instead was specifically directed to a self-referential table in a computer database.⁹⁶ Consequently, the court did not identify any pre-emption-related concerns. Thus, the Federal Circuit found that the relevant claims were subject-matter eligible.

The *Bascom* case

The claimed invention in *Bascom* comprised an improved software tool for allowing control of information received over the internet, i.e. filtering software.⁹⁷ The improvement over prior art filters consisted in not only placing the filtering software at a location remote to the computer at which filtering was carried out, but also allowing the user to implement individually customisable

⁸⁴ *DDR Holdings* 773 F. 3d 1245, 1248 (2014).

⁸⁵ *DDR Holdings* 773 F. 3d 1245, 1248–1249 (2014).

⁸⁶ *DDR Holdings* 773 F. 3d 1245, 1257 (2014).

⁸⁷ *DDR Holdings* 773 F. 3d 1245, 1258 (2014).

⁸⁸ *DDR Holdings* 773 F. 3d 1245, 1259 (2014).

⁸⁹ *Enfish LLC v Microsoft Corp* 822 F. 3d 1327, 1330–1333 (2016) (*Enfish*).

⁹⁰ *Enfish* 822 F. 3d 1327, 1332–1333 (2016).

⁹¹ *Enfish* 822 F. 3d 1327, 1333 (2016).

⁹² *Enfish* 822 F. 3d 1327, 1336–1337 (2016).

⁹³ *Enfish* 822 F. 3d 1327, 1336 (2016).

⁹⁴ *Enfish* 822 F. 3d 1327, 1338 (2016).

⁹⁵ *Enfish* 822 F. 3d 1327, 1339 (2016).

⁹⁶ *Enfish* 822 F. 3d 1327, 1337 (2016).

⁹⁷ *Bascom Global Internet Services Inc v AT&T Mobility LLC* 827 F. 3d 1341, 1344–1345 (2016) (*Bascom*).

filtering at the remote site.⁹⁸ The former, i.e. siting the software remotely, which was known in the prior art, simplified installation efforts, provided robustness against modification or thwarting by hostile parties, and made it easier to update the software (because such relevant actions did not have to be taken at each user computer, and could be carried out at the remote site for a plurality of users).⁹⁹ However, such remotely located filters of the prior art only provided a one-size-fits-all filter that was not individually customisable by each of the users served by the remotely located filter.¹⁰⁰ The invention in the patent of *Bascom* enabled individually customisable filters to be implemented by remotely located filtering software by exploiting the functionality in certain networks of allowing the internet service provider (ISP) to associate an individual user with specific requests to access a website or content over the internet.¹⁰¹ (For example, such networks may require a log-in process with the ISP, which permits such association.¹⁰²) Identification of individual users through their internet communications then allows the filtering software to carry out individually customisable filtering.¹⁰³

The Federal Circuit initially agreed with the district court that filtering content is an abstract idea, because it is a longstanding, well-known method of organising human behaviour, similar to concepts previously found to be abstract.¹⁰⁴ However, the Federal Circuit disagreed with the district court's finding that the claims did not disclose an inventive concept under the second step of the *Mayo* framework.¹⁰⁵ The Federal Circuit, stating that an inventive concept can be found in the non-conventional and non-generic arrangement of known, conventional pieces, found a sufficient inventive concept in the installation of a filtering tool at a specific location, remote from the end-users, with customisable filtering features specific to each end-user.¹⁰⁶ The Federal Circuit further found that the claim would not pre-empt all ways of filtering content on the internet, and that, similar to the invention in *DDR Holdings*, the claimed invention represents a software-based invention that improves the performance of the computer system itself.¹⁰⁷ Thus, the Federal Circuit found that the relevant claims were subject-matter eligible.

The *McRo* case

The claimed invention in *McRo* comprised an improved method for animating a 3-D representation of character's face while speaking.¹⁰⁸ In the prior art method, an animator, using a computer, would manually synchronise the movement of the lips and the facial expression of the speaking 3-D character in a few instants by "manipulate[ing] the character model until it looked right".¹⁰⁹ Then, the computer would interpolate from corresponding numerical values of parameters determining the image to create intermediate frames.¹¹⁰ In the invention of *McRo*, complete automation of the animation is achieved by using rules that are applied to the timed transcript of the speech to determine values of the parameters that determine the image.¹¹¹ For example, one such rule is to automatically insert a transition starting shortly before the first syllable after a silence; the transition marks when the character begins to transition from silence to the image target for the first pronounced syllable.¹¹² The insertion of such a transition corresponds to automatically placing an image of the movement of lips at a time before sound is produced, which more closely corresponds to real speech by a real character.¹¹³ The relevant claim recites that the rules define parameter values as a function of a sequence of phonemes (i.e. sounds, which collectively correspond to the speech) and the timing of the phoneme sequence.¹¹⁴

The Federal Circuit disagreed with the district court's finding that the relevant claim was drawn to the abstract idea of automated rules-based use of parameter values for lip-synchronised three-dimensional animation.¹¹⁵ The Federal Circuit initially stated that, regardless of consideration of step one or step two of the *Mayo* framework, a court must look to the claims as an ordered combination, without ignoring the requirements of the individual steps.¹¹⁶ The court found that the specifically formulated rules, which were claimed as functions of phoneme sequences, limited the breadth of the invention and did not impermissibly pre-empt all techniques for automating 3-D animation that rely on rules.¹¹⁷ Moreover, the court found that the invention did not merely automate the prior-art process of animation; this was because "it

⁹⁸ *Bascom* 827 F. 3d 1341, 1344–1345 (2016).

⁹⁹ *Bascom* 827 F. 3d 1341, 1344 (2016).

¹⁰⁰ *Bascom* 827 F. 3d 1341, 1344 (2016).

¹⁰¹ *Bascom* 827 F. 3d 1341, 1344–1345 (2016).

¹⁰² *Bascom* 827 F. 3d 1341, 1344–1345 (2016).

¹⁰³ *Bascom* 827 F. 3d 1341, 1345 (2016).

¹⁰⁴ *Bascom* 827 F. 3d 1341, 1348 (2016).

¹⁰⁵ *Bascom* 827 F. 3d 1341, 1349–1350 (2016).

¹⁰⁶ *Bascom* 827 F. 3d 1341, 1350–1351 (2016).

¹⁰⁷ *Bascom* 827 F. 3d 1341, 1350–1351 (2016).

¹⁰⁸ *McRo Inc v Bandai Namco Games America Inc* 837 F. 3d 1299, 1303 (2016) (*McRo*).

¹⁰⁹ *McRo* 837 F. 3d 1299, 1305–1306 (2016).

¹¹⁰ *McRo* 837 F. 3d 1299, 1306 (2016).

¹¹¹ *McRo* 837 F. 3d 1299, 1306–1307 (2016).

¹¹² *McRo* 837 F. 3d 1299, 1307 (2016).

¹¹³ *McRo* 837 F. 3d 1299, 1307 (2016).

¹¹⁴ *McRo* 837 F. 3d 1299, 1307–1308 (2016).

¹¹⁵ *McRo* 837 F. 3d 1299, 1313 (2016).

¹¹⁶ *McRo* 837 F. 3d 1299, 1313 (2016).

¹¹⁷ *McRo* 837 F. 3d 1299, 1315–1316 (2016).

[did] not evaluate sub-sequences, generate transition parameters or apply transition parameters to create a final [set of parameters for facial animation]”, in accordance with the relevant claim.¹¹⁸ The court found that neither the fact that the rules of the invention were processed by software running on general-purpose computers, nor the fact the invention was not tangible barred patent eligibility; in this respect, the court stated that “[t]he concern underlying the exceptions to § 101 is not tangibility, but preemption”.¹¹⁹ Furthermore, the court indicated that the claim was directed to a patentable, technological improvement to the field of 3-D animation techniques.¹²⁰ Based on this discussion, the Federal Circuit found that the relevant claims were subject-matter eligible.

The *Amdocs* case

The claimed invention in *Amdocs* comprised an improved system for allowing network service providers to account and bill for internet protocol network communications.¹²¹ The improvement consisted in use of a distributed architecture that minimized the impact on network and system resources by collecting and processing data close to its source.¹²² Such distributed architecture aspects included distributed data gathering, filtering and enhancements that enable load distribution; these aspects allowed data to reside close to the information sources, thereby reducing congestion, while still allowing data to be accessed from a central location.¹²³ The invention is an improvement over prior art systems that stored information in one location, which required massive record flows from the network devices and further required huge databases.¹²⁴ The distributed architecture aspect of the invention was not directly claimed; the relevant claims, for example, recited “enchan[cing]” accounting records, which the court in a previous proceeding had interpreted based on the disclosures of the specification to mean the processing of network usage records close to their sources in a distributed architecture before being transmitted to a centralised manager.¹²⁵

The court found the “enhancing” element to be sufficient for eligibility, because it involved the working in an unconventional manner of arguably generic network devices and components.¹²⁶ Further, the court stated that the claims were narrowly drawn to not pre-empt any and

all generic enhancement of data in a similar system.¹²⁷ Favoursably comparing the invention and corresponding claim to those in *Bascom* and *DDR Holdings*, the court found that the invention served to improve the performance of the system itself.¹²⁸

The evolution in the Federal Circuit’s *Mayo* and *Alice*-based thinking

These cases appear to mark an evolution in the Federal Circuit’s interpretation of the *Mayo* framework and *Alice* towards a more liberal regime of subject-eligibility of CI inventions. One may contrast the facts and outcome in these cases with earlier Federal Circuit decisions. For example, in the *Ultramercial* case, which was decided shortly after the Supreme Court’s *Alice* decision, the patented invention was a method for distributing copyrighted media products over the internet where the consumer receives a copyrighted media product at no cost in exchange for viewing an advertisement, and the advertiser pays for the copyrighted content.¹²⁹ The Federal Circuit found that the relevant claims were not subject-matter eligible, because it found that the process of receiving copyrighted media, selecting an ad, offering the media in exchange for watching the selected ad, displaying the ad, allowing the consumer access to the media, and receiving payment from the sponsor of the ad all describe an abstract idea, devoid of a concrete or tangible application.¹³⁰ The court further found that there were no additional aspects that conferred subject-matter eligibility under the second step of the *Mayo* framework.¹³¹

Although, superficially, the invention in *Ultramercial* appears to be the mere application in the internet context of the idea of serving content to a user in return for viewing advertising, the court could have focused on other aspects of the invention to reach the opposite result. For example, the invention allowed each user to separately make a decision to view or not view advertising in exchange for the desired content, unlike applications in previously known media like radio or television.¹³² This feature is similar, for example, to the individually customisable filter in *Bascom*, which was an important aspect of the Federal Circuit’s finding of subject-matter eligibility in that case.¹³³ The capability provided by *Ultramercial*’s invention of allowing customers to choose between viewing both desired content and advertising or

¹¹⁸ *McRo* 837 F. 3d 1299, 1314 (2016).

¹¹⁹ *McRo* 837 F. 3d 1299, 1314–1315 (2016).

¹²⁰ *McRo* 837 F. 3d 1299, 1316 (2016).

¹²¹ *Amdocs (Israel) Ltd v Openet Telecom Inc* No.2015-1180, slip op. at 3 (Fed. Cir. 1 November 2016) (*Amdocs*).

¹²² *Amdocs* No.2015-1180, slip op. at 4 (Fed. Cir. 1 November 2016).

¹²³ *Amdocs* No.2015-1180, slip op. at 4 (Fed. Cir. 1 November 2016).

¹²⁴ *Amdocs* No.2015-1180, slip op. at 4 (Fed. Cir. 1 November 2016).

¹²⁵ *Amdocs* No.2015-1180, slip op. at 22 (Fed. Cir. 1 November 2016).

¹²⁶ *Amdocs* No.2015-1180, slip op. at 22–23 (Fed. Cir. 1 November 2016).

¹²⁷ *Amdocs* No.2015-1180, slip op. at 24 (Fed. Cir. 1 November 2016).

¹²⁸ *Amdocs* No.2015-1180, slip op. at 25 (Fed. Cir. 1 November 2016).

¹²⁹ *Ultramercial Inc v Hulu LLC* 772 F. 3d 709, 712 (2014) (*Ultramercial*).

¹³⁰ *Ultramercial* F. 3d 709, 714–715 (2014).

¹³¹ *Ultramercial* F. 3d 709, 715–716 (2014).

¹³² *Ultramercial* F. 3d 709, 712 (2014).

¹³³ *Bascom* 827 F. 3d 1341, 1350 (2016).

viewing neither arguably solved a problem specific to computer, and specifically, internet, technology.¹³⁴ Nevertheless, the Federal Circuit found that the invention of *Ultramercial* was not patent eligible.

Conclusions regarding the Federal Circuit cases finding patent eligibility

The 2016 Federal Circuit cases discussed above suggest that the Federal Circuit views the *Mayo* framework in a manner that is more liberal regarding patent eligibility than might otherwise be understood based on just the *Mayo* and *Alice* decisions. In these cases, the respective inventions were not only implemented on general-purpose computers and/or generic components, but the improvements over the prior art were not physical or tangible.

In terms of the USPTO guidance discussed above, in these decisions, the court found additional elements that amounted to significantly more than the judicial exception based on its view that the relevant improvements were directed to functionality of the computer itself (e.g. as in *Enfish*, *Bascom* and *Amdocs*, where the respective improvements were to the computer or computer system itself), or another technology or technical field (e.g. as in *McRo*, where the improvement was to the field of 3-D animation techniques).

Additionally, the court in each of these cases investigated the degree of pre-emption of technology that would result from finding the respective invention patent eligible. However, the court appeared to frame this issue narrowly; in each case, the court, by focusing on the specific improvement over the prior art enabled by the invention, found that the invention did not pre-empt the underlying technology area broadly.

Finally, considering the earlier *Ultramercial* decision in light of the 2016 Federal Circuit cases finding subject-matter eligibility, one may state the principle that the Federal Circuit is using the abstraction inquiry as a proxy for whether or not the concept behind the invention was previously known from other contexts. In the *Ultramercial* decision, the court found that the concept of advertising in exchange for desired content was abstract; it possibly did so implicitly based on its awareness that the concept was already exploited in other contexts such as television and radio broadcasting.¹³⁵ As an operational matter, the existence of advertising in exchange for desired content in the context of television and radio may have allowed the court to distil the concept (i.e. advertising in exchange for desired content) from the context (i.e. television and radio) and allow the court

to claim that the *Ultramercial* invention was merely the application of the abstract idea of advertising in exchange for desired content in the context of the internet (which should not be subject-matter eligible given *Alice* and USPTO guidance, because the invention viewed in that manner would merely comprise instructions to implement an abstract idea on a computer or computer system).

Although these decisions should give some optimism to patent applicants and patentees of CI inventions, it remains to be seen whether the Supreme Court will take the same view in future appeals of Federal Circuit decisions finding patent eligibility.

Comparison of the subject-matter eligibility requirements for patentability in EPO law and in the US

The procedures for determining subject-matter eligibility in the EPO and in the US are formally different. Generally speaking, the EPO's initial threshold for determining subject-matter eligibility for CI inventions is relatively low. However, as discussed above, the subject-matter eligibility inquiry has been partially offloaded into the inventive step inquiry through the EPO Technical Board of Appeal-developed rule that non-technical features do not contribute to inventive step.¹³⁶ This rule requires that inventive step can only be found based on the technical features of the invention.

Generally, however, determining whether a feature is technical or non-technical is difficult and involves legal uncertainty. For example, different panels of the EPO's Technical Board of Appeal have vacillated regarding whether a particular feature was technical or not. For example, the Technical Board of Appeal in one decision found that the presentation of information on a display that improves readability of displayed content is technical.¹³⁷ However, more recently, the Technical Board of Appeal has found that this is not technical.¹³⁸ Thus, the EPO's methodology for determining subject eligibility for CI inventions involves legal uncertainty.

In the US, the *Alice*-based subject-matter eligibility criterion requires a determination of whether the claim is directed to an abstract method. Although the USPTO's guidance indicates that this may be done based on prior decisions of courts finding various concepts to be abstract, in practice, predicting whether a particular claim is directed to an abstract idea is not straightforward and involves a great deal of legal uncertainty. After all, a patent claim at some level relates to a particular functionality that is desired and is carried out by the device or process recited in the patent claim. That

¹³⁴ See, e.g., *Enfish* 822 F. 3d 1327, 1336 (2016) (finding that the claims at issue were not directed to an abstract idea within the meaning of *Alice*, but rather that they were directed to a specific improvement to the way computers operate, as embodied in the self-referential table of the claimed invention.)

¹³⁵ *Ultramercial* F. 3d 709, 714–716 (2014) (finding that the steps of the claim comprise the abstract concept of offering media content in exchange for viewing an advertisement, and that adding routine additional steps does not transform an otherwise abstract idea into patent-eligible subject matter. The court stated that “the claimed sequence of steps comprises only ‘conventional steps, specified at a high level of generality,’ which is insufficient to supply an ‘inventive concept’”).

¹³⁶ *Hitachi* (21 April 2004), <https://www.epo.org/law-practice/case-law-appeals/recent/t030258ex1.html> [Accessed 1 June 2017]

¹³⁷ T 0049/04 (*Text Processor/WALKER*) (EPO Bd Appeal, 18 October 2005), <http://www.epo.org/law-practice/case-law-appeals/recent/t040049eu1.html> [Accessed 1 June 2017].

¹³⁸ T 1562/11 (*Closing out white space/SAP*) (EPO Bd Appeal, 3 June 2015), <https://www.epo.org/law-practice/case-law-appeals/recent/t111562eu1.html> [Accessed 1 June 2017].

functionality may be characterised at differing levels of abstraction.¹³⁹ For example, a claim directed to compressing video data according to a particular embodiment to minimise the bandwidth cost and transmission time of video data could be characterised by any of the following levels of abstraction:

- transmission of data;
- transmission of compressed data;
- transmission of video data; or
- transmission of compressed video data using the particular algorithm.

Arguably, the first three characterisations above articulate abstract subject-matter; whereas it is not clear whether or not the last characterisation, in which the functionality underlying the claim has been stated most granularly, relates to an abstract idea. Given the absence of useful, practical guidelines in determining how to determine whether a claim is directed to an abstract idea, this step of the *Alice*-based subject-matter eligibility inquiry is fraught with difficulty and legal uncertainty.

The next step in the *Alice*-based subject-matter eligibility inquiry is determining whether the claims recite additional elements that amount to significantly more than the judicial exception. This inquiry has some parallel to the EPO's rule of discounting non-technical features in determining inventive step. However, this step, unlike the EPO's methodology, is not anchored to any formalism (like the problem-solution formalism of the EPO in assessing inventive step); essentially, the decision-maker is forced to assess the non-abstract idea elements and somehow determine whether or not they are "significant". This step of the inquiry is also fraught with difficulty and legal uncertainty.

Based on consideration of the methodologies of determining subject-matter eligibility in the EPO and US, it is not possible to *prima facie* reach a conclusion regarding whether the EPO or the US methodology is more liberal in its treatment of CI inventions.

In fact, neither methodology can be said to be more favourable than the other in allowing subject-matter eligibility across all contexts. For example, as discussed above, the EPO methodology provides that express recitation of the use of a computer, a computer network or a computer-readable storage medium confers technical character on the invention, and the invention is not excluded from patentability for subject-matter eligibility

reasons.¹⁴⁰ (As discussed above, however, part of the inquiry is offloaded into the inventive step inquiry, in which the EPO finds that non-technical features of the invention do not contribute to inventive step.) However, in the US, elements of a claim relating to implementation by a generic computer do not result in a finding that the claim recites additional elements that amount to significantly more than the judicial exception.¹⁴¹

Similarly, there are some classes of inventions which would likely be found subject-matter ineligible in the US, but which have been found to be subject-matter eligible under EPO law. For example, a claim directed to an electromagnetic signal carrying computer-readable instructions for performing a method has been found based on pre-*Alice* case law to not be subject-matter eligible, whereas the EPO has found such claims subject-matter eligible.¹⁴² Additionally, although the more recent Federal Circuit case law discussed above can be used to argue otherwise, it is likely that a claim directed to a computer-readable data structure (with no significant additional limitations) would be found subject-matter ineligible in the US, given that a data structure is an abstract construct. However, the EPO has found that under certain circumstances, a data structure may have technical character and thus be subject-matter eligible.¹⁴³

The above examples suggest that there are at least some CI inventions implemented on generic computers that are subject-matter eligible in the EPO but not in the US. However, there are contexts in which the reverse holds. For example, in the context of graphical user interfaces, recent decisions of the EPO have found that the presentation of information on a display that improves readability of displayed content is not technical, and thus cannot contribute to inventive step.¹⁴⁴ However, in the US, graphical user interface inventions, such as automatically relocating textual information in a window upon obscuring of the textual information by another window, may be subject-matter eligible and patentable.¹⁴⁵ Thus, in this context, the US methodology appears to be more liberal in finding certain inventions directed to displaying information subject-matter eligible.

In conclusion, although the EPO's methodology at least provides a more definite formalism, both the EPO and US methodologies for determining subject-matter eligibility involve legal uncertainty and present difficulties for practitioners, applicant and patent holders.

¹³⁹ See, e.g., *Amdocs* No.2015-1180, slip op. at 20–21 (Fed. Cir. 1 November 2016) (quoting *Alice* and *Mayo* by stating "[a]t some level, all inventions ... embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas", and asking "[w]hat relative level of abstraction should we employ?"); *McRo* 837 F. 3d 1299, 1312 (2016) (quoting *Mayo* and stating that "all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas"); *Enfish* 822 F. 3d 1327, 1337 (2016) (stating that "describing the claims at ... a high level of abstraction and untethered from the language of the claims all but ensures that the exceptions to § 101 swallow the rule.").

¹⁴⁰ See, e.g., G-3/08, *Programs for Computers* [2010] O.J.E.P.O 17 (EPO Enlarged Bd Appeal, 12 May 2010), [http://documents.epo.org/projects/babylon/eponet.nsf/0/DC6171F182D8B65AC125772100426656/\\$File/G3_08_Opinion_12_05_2010_en.pdf](http://documents.epo.org/projects/babylon/eponet.nsf/0/DC6171F182D8B65AC125772100426656/$File/G3_08_Opinion_12_05_2010_en.pdf); Guidelines for Examination in the European Patent Office, Part G, EPO Guidelines for Patentability (November 2015) [Both accessed 1 June 2017]

¹⁴¹ *Alice* 134 S. Ct 2347, 2358 (2014).

¹⁴² *In re Nuijten* 500 F. 3d 1346 (Fed. Cir. 2007); T 0163/85 (*Colour television signal*) (EPO Bd Appeal, 14 March 1989), <https://www.epo.org/law-practice/case-law-appeals/recent/t0163ep1.html> [Accessed 1 June 2017].

¹⁴³ T 1194/97 (*Data structure product/PHILIPS*) (EPO Bd Appeal, 15 2000), <https://www.epo.org/law-practice/case-law-appeals/recent/t1194ex1.html> [Accessed 1 June 2017].

¹⁴⁴ T 1562/11 (*Closing out white space/SAP*), (EPO Bd Appeal, 3 June 2015), <https://www.epo.org/law-practice/case-law-appeals/recent/t11562eu1.html> [Accessed 1 June 2017].

¹⁴⁵ USPTO, *Update* (30 July 2015), Appendix 1, pp.7–12.

Additionally, it cannot be said that one or the other methodology is more liberal in finding CI inventions to

be subject-matter eligible across all contexts.