

Computer Implemented Inventions (CIIs)

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Introduction

This article is to provide an outline of the key parameters in major jurisdictions regarding computer implemented inventions so that the attorney, particularly when drafting a patent application for their own jurisdiction which may need to be extended to other jurisdictions, such as using the international patent cooperation treaty, can be aware of key issues at the priority date and therefore potentially avoid those issues later.

This article is presented by patent committee as part of a series for 2022, further articles include poison words (words to avoid) in patent applications by jurisdiction, double patenting, claims construction and others to follow.

Each of the topics, and in any area of law is in continual development and it is expected that these articles will be published and updated. Contributions for jurisdictions not reviewed here are welcome. If wishing to contribute please contact myself, Mark Houghton, in my role as current Chair of the patent committee of AIPF.

1. Computer implemented inventions (CIIs) at the EPO

Contributed by Dr Mark Houghton and Harriet Coulthard from Patent Outsourcing Limited.

At the EPO, computer implemented inventions, or CIIs are defined as claims which involve computers, computer networks or other programmable apparatus wherein at least one feature is realised by means of a computer program. In this article we aim to help you navigate the EPO guidelines and hopefully avoid the potential pitfalls that we see day to day as European attorneys.

Programs for computers are excluded from patentability under Article 52(2)(c) of the EPC. However, the exclusion does not apply to computer programs which have technical character.

In order for a computer program to have technical character it must produce a further technical effect when run on a computer. This further technical effect must go beyond standard interactions between the computer program and the hardware it is run on. That is, merely saying that the computer program is run on a computer is not sufficient to claim a technical effect.

The Guidelines for examination have some useful examples of further technical effects in G-II, 3.6.1. A computer program which specifies a method of controlling an anti-lock braking system in a car, determining emissions by an X-ray device, compressing video, restoring a distorted digital image, and encrypting electronic communications are all considered to bring about a further technical effect when run on a computer.

Equally, the EPO accepts that there may be further technical effect in the case where a program is designed based on specific technical considerations of the internal functioning of the computer on which it is to be executed for example by being adapted to the specific architecture of the computer.

There are more examples and the definition of what is technical at the EPO is purposefully left open ended so as to not exclude, new, as yet unimagined inventions. This can, understandably, make it difficult to understand whether or not an invention will be considered technical, especially in the notoriously grey area of computer implemented inventions.

In our day to day practice, we come across a lot of non-European applications for prosecuting at the EPO. Often these applications have not been written with the EPO in mind. In some cases, this results in being on the back foot with the examiner from the start. From our experience, we have put together some pitfalls to avoid if you hope to prosecute your application at the EPO:

- Not considering the EPO's approach to inventive step when drafting.
All too often as European attorneys, we receive applications to prosecute at the EPO where, due to the way the application was drafted, we are fighting an uphill battle with the EPO. Take the time to look at the guidelines, and make sure that all technical effects are well defined in the description. When drafting, think about the problem and solution approach and write with that in mind. It's far easier to convince an examiner that your novel feature has technical effect if it is written in the description than if you appear to be pulling it out of thin air as an afterthought.
- Not disclosing the technical effect explicitly
Off the back of the previous point, it is incredibly important that the step or feature that causes the technical effect is explicitly disclosed in the description and claims. It may sound obvious, but we see a lot of inventions that use computer implemented means to calculate something, e.g., that a plane is likely to crash based on its trajectory, but doesn't go on to use that result to create a technical effect, e.g., diverting the plane.

- Writing claims in an incorrect format.
The EPO is very specific as to the wording of claims to computer implemented inventions, examples of the correct structures are given in the guidelines at F-IV, 3.9 and its sub sections.
- Not making it clear which method steps are carried out by which entities.
If the invention requires interaction between different entities, make it abundantly clear which features are carrying out which actions in your invention. For example, you have a computer implemented method that requires user interaction, make it clear which steps are carried out by the user. Although it can make for clunky reading at times, ensure that in the description it is explicitly laid out which features of the invention do what. This way, if the examiner raises a clarity objection, you have explicit basis to amend your claims to address it.
- Not including detailed examples in the description.
Using detailed examples of the invention in use can give you access to results to draw upon if you need to argue technical effect.
This is especially important in AI inventions where it is advised to include details of any training data used, how the training was carried out and the results.
It can also be useful to tie the invention to the real world by using examples that are specific to a use case.

As you can see, prosecuting an application to a computer implemented invention at the EPO can get a bit complicated. If in doubt, consult a qualified European patent attorney and they should be able to keep you on the right track. The best time to address the above issues is at the drafting stage, the EPO's strict approach to added matter makes it particularly difficult, and often impossible, to rectify any oversights made in the drafting process once your application is under examination.

2. Subject Matter Eligible for Patent Protection at the USPTO

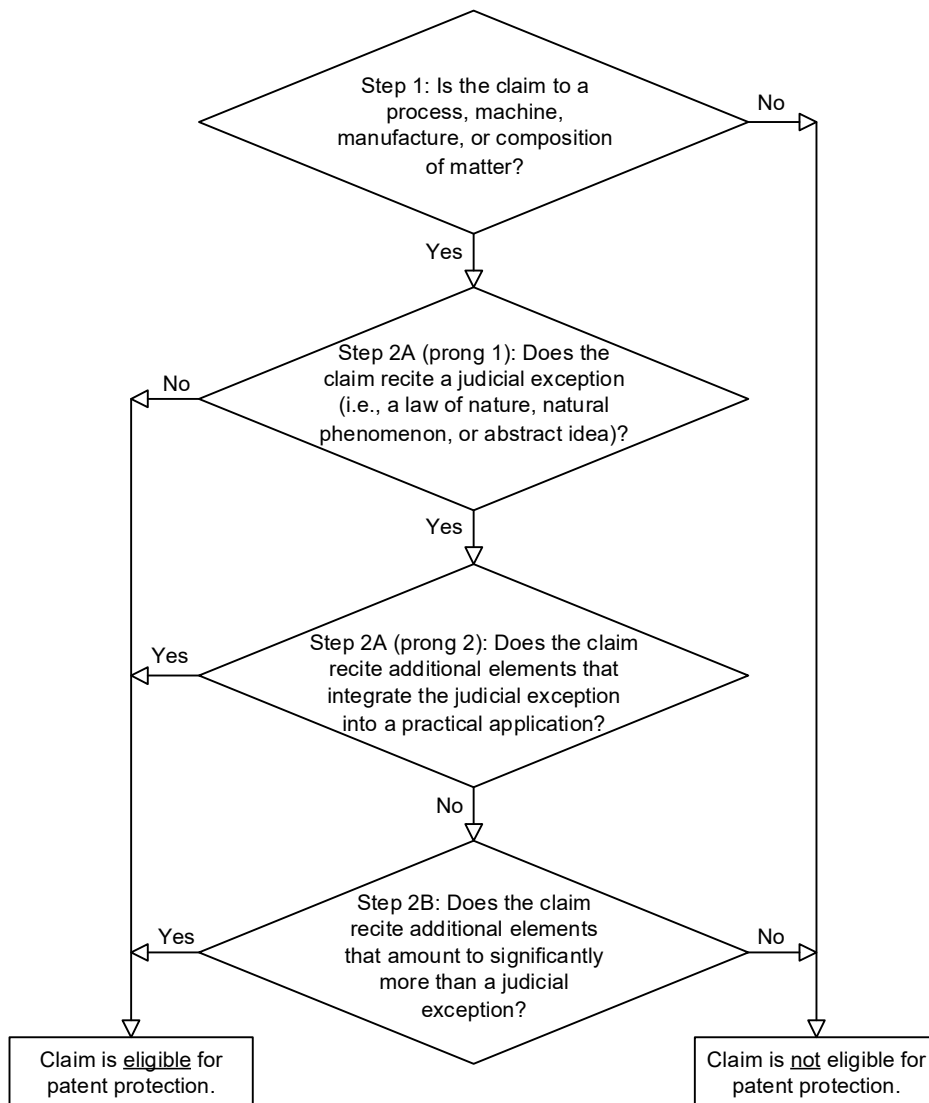
Contributed by Michael V. Battaglia of Rothwell, Figg, Ernst & Manbeck, P.C.

The text of the U.S. statute (35 U.S.C. 101) that defines subject matter eligible for patent protection seems straightforward and broad:

Whoever 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.¹

The legislative history of the statute indicates that Congress intended this statute to broadly include anything under the sun that is made by man. However, in interpreting the statute, the courts created exceptions that limit the subject matter that is eligible for patent protection. In doing so, the courts complicated greatly the eligibility analysis in the U.S.

The flowchart below illustrates the subject matter eligibility test employed by the USPTO.



¹ The conditions and requirements include, among others, novelty, non-obviousness, written description, enablement.

In step 1, the USPTO looks at whether a claim is directed to a statutory category (i.e., a process, machine, manufacture, or composition of matter). For example, on one hand, a claim directed to a method or apparatus is directed to a statutory category. On the other hand, a claim directed to a computer program/software per se is not directed to a statutory category. Similarly, a claim directed to a computer readable medium that can be a carrier wave is also not directed to a statutory category. A claim that is not directed to a statutory category is not eligible for patent protection.

In step 2A, the USPTO looks at whether the claim is directed to a judicial exception. Judicial exceptions include laws of nature, natural phenomena, and abstract ideas. Abstract ideas include mathematical concepts (e.g., mathematical relationships, mathematical formulas or equations, and mathematical calculations), certain methods of organizing human activity, and mental processes. Step 2A is a two-prong inquiry. Prong 1 looks at whether the claim recites a judicial exception. Prong 2 looks at whether the recited judicial exception is integrated into a practical application of that exception. If either (1) the claim does not recite a judicial exception or (2) additional claim elements integrate the recited judicial exception into a practical application of that exception, the claim is not directed to a judicial exception and is, therefore, eligible for patent protection.

With respect to prong 1, claims for computer implemented inventions sometimes recite an abstract idea because they often involve mathematical calculations (e.g., performing a resampled statistical analysis to generate a resampled distribution or calculating a number representing an alarm limit value using a mathematical formula) and/or processes that could be performed in the mind (e.g., data analysis steps claimed at a high level of granularity). Moreover, a claim can recite a mental process even if it claimed as being performed on a computer (e.g., if the mental process is performed by a generic computer).

With respect to prong 2, simply implementing a mathematical principle on a physical machine (e.g., a computer) may not be a patentable application of that principle. Similarly, courts have found adding insignificant extra-solution activity and/or generally linking the use of a judicial exception to a particular technological environment or field of use to not integrate the judicial exception into a practical application.

However, examples of additional claim elements that courts have found to integrate a judicial exception into a practical application include (i) an improvement in the functioning of a computer, or an improvement to other technology or technical field, (ii) applying or using a judicial exception to effect a particular treatment or prophylaxis for a disease or medical condition, (iii) implementing a judicial exception with, or using a judicial exception in conjunction with, a particular machine or manufacture that is integral to the claim, and (iv) effecting a transformation or reduction of a particular article to a different state or thing. *See* MPEP § 2106.04(d)(I).

Examples of practical applications via improvements to computer technology (as opposed to merely invoking a computer as a tool) include (i) a modification of conventional Internet hyperlink protocol to dynamically produce a dual-source hybrid webpage, (ii) an inventive distribution of functionality within a network to filter Internet content, (iii) a method of rendering a halftone digital image, and (iv) a distributed network architecture operating in an unconventional fashion to reduce network congestion while generating networking accounting data records. Examples insufficient to show an improvement to a technology include (i) a commonplace business method being applied on a general purpose computer, (ii) gathering and analyzing information using conventional techniques and displaying the result, and (iii) a general method of screening emails on a generic computer. *See* MPEP § 2106.05(a)(I).

An example of a practical application via a particular machine is an antenna having a particular shape and arrangement of conductors. In contrast, a general purpose computer that applies a judicial exception by use of conventional computer functions does not qualify as a particular machine. *See* MPEP § 2106.05(b)(I).

Lastly, in step 2B, the USPTO looks at whether the claim amounts to significantly more than the judicial exception (e.g., whether additional claim elements amount to an inventive concept). An additional claim element may amount to significantly more than the judicial exception if it is not well-understood, routine, or conventional. If additional claim elements amount to significantly more than the judicial exception, the claim is eligible for patent protection. *See* MPEP § 2106.05(d)(I). If not, the claim is not eligible for patent protection.

Like at the EPO, prosecuting an application to a computer implemented invention at the USPTO can be complicated. If in doubt, consult a qualified U.S. patent attorney. Here too, the best time to address subject matter eligibility is at the drafting stage (e.g., by including descriptions of practical applications of any judicial exceptions).

3. Computer implemented inventions (CIIs) at the Brazilian Patent and Trademark Office (BPTO)

Contributed by Camila Castro of MT4IP

Computer-implemented inventions (CIIs) in Brazil, in turn, have their examination guidelines defined by the BPTO since 2016, by Resolution No. 158. In this Resolution, the BPTO clarifies how concepts can be applied to Brazilian patent applications, and requirements already used by the EPO for granting CIIs, harmonizing the decisions, since article 10, item V, of the Brazilian Industrial Property Law (Law No. 9,279/96) expressly prohibits the granting of patents for computer programs in itself, for not considering them inventions. The resolution defines what is considered patentable CIIs:

- industrial creations that involve a product or process that solves a technical problem;
- produce a technical effect that does not relate solely to the way this computer program is written, such as optimization of hardware resources or data switching; and
- meet the essential requirements of novelty, inventive step and industrial application provided for in article 8 of the Law No. 9,279/96.

It is important to clarify that if the technical effects are a result of changing of computer program code and not method, the creation is not considered an invention. Furthermore, the mere interaction between the computer program and the hardware does not guarantee that the creation will be considered an invention. Therefore, it is important to look for the assistance of a specialist to discern whether the technical effect of this interaction is intentional and directly controlled by the invention itself, that is, if there is a direct causal relationship between the invention and the technical effect. So, in this case, there are two objects to be protected by this type of patent: the process that achieves the technical effect and the computer program.

Another important aspect of this Resolution is to give examples of how technologies implemented by software can be characterized as inventions. To this end, some rules must be observed, such as not using the expressions “financial/therapeutic/business method”, “software” and “computer program” in the claims submitted for examination. Furthermore, in order to avoid violation of the Brazilian norms, patent application claims for excerpts of source code must always require protection for:

- a product, such as a system, device or equipment, when it involves hardware or physical devices operated or implemented by software; and
- a process or method, when it involves a sequence of logical (such as algorithms) or physical steps implemented by the software.

However, recently, due to the intensive increase in the use of technologies such as the internet of things (IoT) and artificial intelligence (AI), the BPTO published a new CIIs exam guideline, Resolution n° 2608 of 2020. This new Resolution modifies in Resolution No. 158 of 2016 some analysis parameters, such as:

- It establishes that AI techniques, encompassing machine learning and deep learning tools, for example, can be considered inventions. However, such techniques alone are not acceptable unless they are applied to a technical problem and there are resulting technical effects.
- Inventions implemented in IoT environments will be examined like any other CIIs.

At last, it is important to mention that all the analysis parameters of the claims present in Resolution No. 158/2016 were maintained. This does not exclude that, soon, the BPTO will have to remedy some guidelines regarding the inventive step, descriptive sufficiency and ownership of inventions created by artificial intelligence. The new guidelines presented in Resolution of 2020 are part of a series of actions by the BPTO to improve policies for the protection of intangible assets in Brazil, taken over the last few years, mainly in relation to the CIIs. CIIs play an important role in Brazil's economic growth, especially in Agrobusiness, where the most advanced technologies are used, contributing to stand out the country in this sector.

4. Computer implemented inventions (CIIs) at IP Australia (IPA)

Contributed by Daniel Pullella and Connie Merlino of FB Rice

In Australia, there are no statutory exclusions prohibiting the patentability of CIIs.

The patent-eligibility of a CII requires that the claims provide a technical contribution over the state of the art, such that there is an *improvement in computing technology*.

In contrast, applications directed to pure abstract ideas, schemes, and intellectual information are not patentable.² It is presently very difficult to secure patent protection in Australia for an invention considered to be a scheme, administrative process, or business method that is implemented in a computing system routinely and without ingenuity.

Patentability test

A two-part test may be applied to assess subject matter patentability based on (a) whether a claimed invention is, in *substance*, a computer-implementation of an otherwise unpatentable scheme, idea, or business process, and (b) if so, whether the claimed CII constitutes an advancement in computer technology (see Figure 1).³

Determining the substance is an exercise in characterizing the claimed invention, and involves construing the claim, as a whole, and then considering where the contribution of the claim (e.g., the "inventiveness" or "ingenuity") lies.⁴ This assessment is independent of the form of the claims (e.g., whether the claims are directed to, for example, a computing system, a machine readable medium storing instructions, or a method reciting steps for execution by a computing device).

The prior art and the common general knowledge may be considered, but only to provide a context for determining the nature of the subject matter in which the contribution resides (i.e., rather than assessing a 'degree' of the contribution, as per an assessment of inventiveness). Significantly, determining the substance should not involve the isolation or removal of particular features based on whether or not they are considered to be 'known'.⁵

Factors that are typically considered to determine whether the substance of the claimed invention is directed to an improved computer or computing system, rather than a scheme or business process, include whether:⁶

- the claimed invention solves a technical problem;
- the contribution of the claimed invention is technical in nature (i.e., if the advancement over the prior art is in technical operations, rather than the scheme or rules);
- the computer is more than an intermediary configured to carry out the method steps;
- the claimed invention requires operations that are foreign to normal computers; and
- the advantages of the claimed invention exist irrespective of the data processed by the computer.

² *Grant v Commissioner of Patents* [2006] FCAFC 120.

³ *Commissioner of Patents vs Aristocrat Technologies Australia Pty Limited* [2021] FCFCA 202, [26].

⁴ *Commissioner of Patents v Rokt Pte Ltd* [2020] FCAFC 86.

⁵ Patent Manual of Practice and Procedure, IP Australia, 2.9.2.1 "Legal Principles".

⁶ *Commissioner of Patents v RPL Central Pty Ltd* [2015] FCAFC 177; *Aristocrat Technologies Australia Pty Limited* [2016] APO 49, [35].

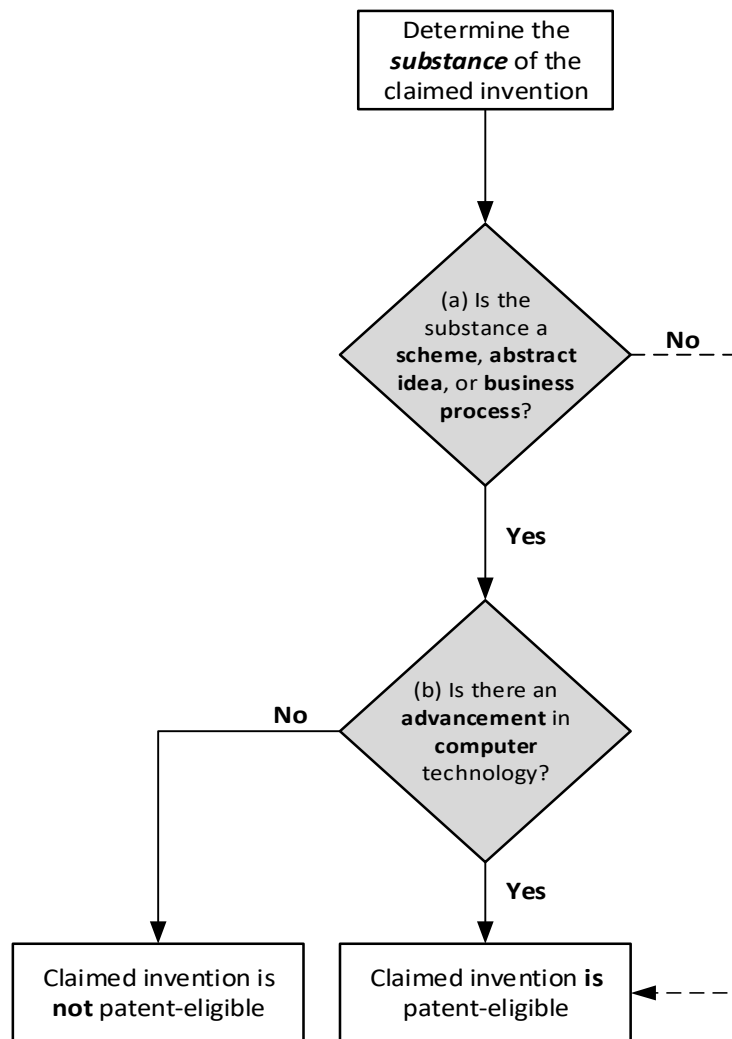


Figure 1: *Determining patent-eligibility of a CII in Australia.*

Even if the substance of the invention is considered a scheme, under part (b) the claims may still be patentable if there is some ingenuity in the computer implementation. That is, at least part of the contribution must pertain to the development of computer technology (and not merely rely on its normal or conventional use).⁷ A development in computer technology can be achieved by, for example, more efficient computing operations, more efficient use of a memory space, improved security of digital data or, in some cases, more efficient use of display area of a graphical user interface.

Examples

CII's that the Australian Courts have found to be unpatentable include: (i) computing a securities index using a computing device that accesses data, processes the data, and accesses and applies a weighting function to assign weights to the data;⁸ (ii) a client-server based system for collecting information relevant to the assessment of an individual's competencies by retrieving assessment criteria from a remotely located server, processing the criteria to automatically generate a plurality of questions, presenting the questions to an individual requiring assessment, receiving responses, and processing the responses to determine qualification;⁹ and (iii) an internet enabled advertising system that inserts an "engagement offer" prior to

⁷ *Commissioner of Patents vs Aristocrat Technologies Australia Pty Limited* [2021] FCFCA 202, [63].

⁸ *Research Affiliates LLC v Commissioner of Patents* [2014] FCAFC 150; 227 FCR 378.

⁹ *Commissioner of Patents v RPL Central Pty Ltd* [2015] FCAFC 177.

the display of an advertisement on the basis of consumer specific information obtained by a widget, and involving an engagement engine, a ranking engine, an objects database and a tracking database, to dynamically create the engagement offer and capture user interactions with the offer in real-time.¹⁰

By contrast, examples of CIIs that are considered to be an improvement in computer technology include: (i) a system for tracking the installation of applications on mobile devices via advertisements, where a record of the successful installation is placed in a shared memory location that is accessible by other applications;¹¹ and (ii) a system and method for using a GUI to present an augmented reality experience to assist individuals with moving around a crowded area to arrive at a point of interest in an efficient manner.¹²

Guidelines and pitfalls

The best approach for addressing potential subject matter eligibility issues during drafting is to emphasize any technical contributions existing in the function, implementation, and application of the software and hardware components, or in the computerization of the underlying method steps. A critical failure of many applications claiming a CII is a lack of technical detail in these areas. For example, common pitfalls in the preparation of the specification include:

- a description of the hardware and software components that implement the method steps using generic or overly broad language (e.g., “any suitable server”), which undermines their technical significance;
- a reliance on generic figures or paragraphs, without further more detailed supporting text, to describe the computer-implementation; and
- a lack of focus on the low-level details of how the computer-implementation operates, and instead focusing solely on an advantage or end result of the processing.

The above are detrimental because they limit the extent to which the claims can validly include features directed to software or programming means for carrying out the contribution. Without such features, IP Australia, or an Australian Court, may conclude that the claimed invention only amounts to an instruction to use the computer for its well-known and understood functions (i.e., that there is no improvement in the computer technology).

Conclusion

Computer Implemented Inventions (CIIs) remain a developing area of law and this article is intended to help as the right questions as to what is important for these jurisdictions and so does not give legal advice as such.

¹⁰ *Commissioner of Patents v Rokt Pte Ltd* [2020] FCAFC 86.

¹¹ *Facebook, Inc.* [2020] APO 19.

¹² *Ebay, Inc.* [2020] APO 49.