

This document is in response to the request by the Australian Commission for feedback on its key points and draft recommendations in Section Chapter 8: Business methods and software patents

As background information, I have a long history in the software Industry, and for many years I have been following and writing about the software patent controversy. You can see my background at [Martin Goetz](#) and in [Wikipedia](#).

This attachment contains five examples of US patents that use a computer and software as all, or part of, the preferred implementation. Many in the media and others refer to these inventions as “software patents”. But these patents should be called computer-implemented patents. The term “software patent” is a misnomer. Please see my article [Lifting the Fog on ‘Software Patents’ – Eliminate that Meaningless Term](#). That article explains that a patent is given only on an invention and not on the software that may be all, or part of, the implementation.

It also is important to discuss the equivalence of software and hardware (electronic circuitry) and that it is an economic choice on how one could implement an invention. It is a fact that software and hardware circuitry are interchangeable. Several of my examples have electronic circuitry as the preferred implementation of the invention rather than software. So does it make sense to *not* award a patent to a true invention if the preferred implementation uses software, but to award a patent to that same invention if the preferred implementation contains an electronic circuit and no software. As noted in [Hardware/Software Tradeoffs: A General Design Principle?](#) “Hardware and software are logically equivalent. Any operation performed by software can also be built directly into the hardware and any instruction executed by the hardware can also be simulated in software. The decision to put certain features in hardware and others in software is based on such factors as cost, speed, reliability and frequency of change. There are no hard and fast rules to the effect that X must go into the hardware and Y must be programmed explicitly. Designers with different goals may, and often do, make different decisions... the boundary between hardware and software is arbitrary and constantly changing. Today's software is tomorrow's hardware, and vice versa.”

In the US, currently [over 50% of all patent applications have software](#) as all, or part of, the preferred implementation in the Specifications (disclosure) of the

application. But, as shown in Example 1, it may not be the software that is at the heart of the invention. So one of the purposes of the five examples below is to demonstrate to the Australian government that the existence of software as part of, or all, the preferred implementation has no bearing on whether a so-called invention in the patent application should, or should not, be granted a patent.

In my article [After Alice: Is New Legislation Needed? Before Alice: Was there a Precedent?](#) I explain why the US Supreme Court's 2014 Alice ruling clearly stated that computer-implemented inventions were patentable subject matter. In the US it is up to the US Courts and the Patent office to decide if a patent application contains a true invention and if the claims in the patent are valid. So it is wrong to state that the US is in the same dilemma as the Australian government on how to treat computer-implemented inventions.

Example 1 – An Artificial Retina Invention

In this example of the [Argus II Retinal Visual Prosthesis](#) invention, the [specification](#) included a pair of glasses attached to a video camera unit and a computer and software. A miniature video camera housed in the patient's glasses sends information to a small computer worn by the patient where it is processed and transformed into instructions transmitted wirelessly to a receiver that is surgically implanted in and around the eye. The signals are then sent to an electrode array, attached to the retina, which emits small pulses of electricity. These electrical pulses are intended to bypass the damaged photoreceptors and stimulate the retina's remaining cells to transmit the visual information along the optic nerve to the brain. Photoreceptors are light-sensitive cells (neurons) in the retina that convert light energy to neural impulses. The photoreceptors are as far as light gets into the visual system. The invention was awarded a special [patent #8,000,000](#) by the USPTO and Time Inc. named the Argus II artificial retina one of the [best 25 inventions of 2013](#).

But let's look closely at the invention. The patent description included a pair of glasses attached to a video camera unit, a computer and software. If one looks at the [Claims and Specifications in the issued patent](#) the following can be seen. In the Claims section there are 12 claims and there is never a mention of software or a computer program. In the Specifications section of the Retina patent there are several mentions of where software is used in the proposed implementation, but there is never any computer program shown or any explanation of how the software would be implemented, except for two very high level flow charts

consisting of 9 flow chart symbols. Most of the specification discusses how the information from a video camera is transformed into signals that are transmitted wirelessly to a receiver that is surgically implanted in and around the eye. The invention uses standard software to convert camera images into instructions to a receiver. The invention is not in the software but in how the images are transmitted to the brain.

One would be hard pressed to call this invention a computer-implemented invention or that the patent is a software patent. But that's how it could be classified because software is shown in the specification. In this example the inventor went from idea to a true medical device invention. Many medical device and prosthesis inventions use a computer and software in their implementation and such inventions have the potential of losing their patent protections in Australia. Is this patent one of those computer-implemented patents that is abstract and just an idea? And not being patentable subject matter? What if the inventor chose to disclose the entire invention using [integrated circuit chips](#) and not software? Would Australia ever want to deny patent protection for inventions like the artificial retina? I doubt it.

Example 2 – A Voice and Speech Recognition Invention

Back in November 2012 Microsoft stated that its researchers have demonstrated [software that translates spoken English into spoken Chinese almost instantly, while preserving the unique cadence of the speaker's voice](#)—a trick that could make conversation more effective and personal.”

Certainly the way Microsoft's researchers accomplished this complex translation is not obvious. Microsoft will try and protect its large research investment with its 2016 patents [TEXT-TO-SPEECH WITH EMOTIONAL CONTENT](#) and [VOICE GENERATION WITH PREDETERMINED EMOTION TYPE](#)

But its patent claims are not that they invented “speech recognition” or “language translation”, or even “voice to voice translations”. Patents for voice and speech recognition patents go back well over 30 years with IBM having over 200 speech recognition patents. And there have also been [language translation patents](#) for many years.

But Microsoft did invent a new way to do voice recognition and language translations and at the same time retain the cadence of the speaker's voice. The

Microsoft inventions indicate how a smart phone could implement the inventions without special hardware. But what if the invention needed a special set of headphones (a special device) that was integral to the invention and that was part of the specification? So is there any difference between a “software only” invention and an invention that requires special hardware? And what if the same invention was specified as an [integrated circuit \(a chip\)](#) in a special modified headphone in the patent application specification section?

Is a speech recognition/translation/cadence and special headphone invention any more innovative than a “speech recognition/translation/cadence” software only invention? What’s important is whether there was an invention, not how the invention was specified in the patent application. And that the specification is sufficient as an adequate disclosure for [someone skilled in the art to carry out the invention](#).

Example 3 – A Reading Machine for the Blind Patent

In 2000, a renowned inventor, [Ray Kurzweil](#) received a patent named [Reading System which Reads Aloud From An Image Representation Of A Document](#). The patent specification shows a diagram of a monitor, scanner, speakers, and a PC computer composed of a processor, storage and a keyboard. The essence of the disclosure and the invention is a logic chart describing a machine system which interacts with a speech synchronizer and the various devices.

The first sentence of the abstract in the patent stated “a reading system includes a computer and a mass storage device including software comprising instructions for causing a computer to accept an image file generated from optically scanning an image of a document.”

At that time, Ray Kurzweil’s company, [Kurzweil Educational Systems](#) marketed a special purpose hardware/software system called the [Kurzweil 3000 Reading Machine](#) which was marketed to the blind and poor readers. Their 2000 year patent protected this product from imitators. Today the company sells a software only system called [Kurzweil 3000](#) and continues to have the protection of the patent system thru his original 2000 patent and with additional patents e.g., [Reducing processing latency in optical character recognition for portable reading machine](#) (which is a software-only patent).

Most would agree that the Kurzweil 3000 Reading Machine, whether implemented in hardware/software or only software, was an invention and deserving of a patent.

Example 4 – A Sorting System

As noted earlier, I have been involved in this software patent controversy for many years. It began when I and my small software company, Applied Data Research, applied for a patent in 1965 for a [Sorting System](#). Basically, my invention was a faster way for sorting data on a general-purpose computer using tape drives that could read data only in a forward direction, which were early IBM tape drives.

There were many sorting patents using special-purpose hardware before mine, but none that used a general-purpose computer. The following sorting patents were referenced in my patent application and were described through circuit diagrams, and as methods and apparatus for sorting data: Sorting Device, Fillebrown, 5/1961 #2,985,864; Sorting Apparatus, Guerber, 5/1960 #2,935,732; Apparatus for sorting of Recorded Digital data, Dirks 3/1966 #3,242,466.

My patent was issued on 23 April, 1968, and a computer publication heralded my patent in a page 1 headline, [‘First Patent is Issued for Software, Full Implications not Known Yet’](#). *Fortune* magazine called it an “unprecedented patent”. Had I specified my invention using circuitry, as had other sorting patents in the past, the controversy of whether software inventions were patentable would have started later in time.

Example 5- The 3-Dimensional Digital Mouse and Game Controller

This is an example of a US patent ([US7683883](#)) that was issued on a 3-D mouse and game controller. In the Specification (the Disclosure) the inventor states “While this invention is described in terms of the best mode for achieving this invention's objectives in a particular application, it will be appreciated by those skilled in the art that variations may be accomplished in view of these teachings without deviating from the spirit or scope of the present invention. *For example, the present invention may be implemented using any combination of computer programming software, firmware, or hardware.*”

So should this invention be designated as a software patent, a firmware patent, or a hardware patent? Obviously, what is significant is that it is a real invention, that it is a contribution to the state-of-the-art, and that the claims are appropriate for the claimed invention. In the US as long as there is a proper disclosure on how an invention can be implemented it is acceptable to the patent office. And under the USPTO guidelines the Specification in the patent application need not be the best mode for implementation. See [“Best Mode Requirement”](#) which states in

III.DESIGNATION AS BEST MODE IS NOT REQUIRED: There is no requirement in the statute that applicants point out which of their embodiments they consider to be their best; that the disclosure includes the best mode contemplated by applicants is enough to satisfy the statute.