



COMPUTER IMPLEMENTED INVENTIONS

Patent trends and outcomes across Australia, the United States and European Union.

Patents for computer implemented inventions (CII) at the margins of subject matter eligibility for patents are more likely to be granted in Australia than in Europe and less likely to be granted in Australia than the United States.

Patent rights play an important role in stimulating innovation which in turn drives economic growth. However, patent protections that are too broad can deter competition and rival innovation efforts. Since the first software innovations emerged, the question of whether software and computer related inventions should be patentable has been a subject of contentious debate. This has intensified as digital technology has become increasingly integral to the way firms operate and innovate.

In Australia, for an invention to be patentable it must be a “manner of manufacture”, an artificially created state of affairs with economic utility. Other jurisdictions have their own definition of what is

patent eligible subject matter (PSM). IP Australia commissioned Swinburne University of Technology to analyse:

1. the patentability of computer implemented inventions, how this compares to other technologies, and differences in outcomes when filed across key jurisdictions, at IP Australia (IPA), the European Patent Office (EPO) and United States Patent and Trade Mark Office (USPTO)
2. how different patentability standards affect the propensity of applicants to file for patents across select jurisdictions, and the effects of significant 2014 court rulings which clarified the margins of patentability for CII in Australia (*Research Affiliates LLC v. Commissioner of Patents [2014]*) and the United States (*Alice Corp v. CLS Bank International [2014]*).

At a glance:

The research identified significant trends and differences in outcomes for CII patents across jurisdictions.

- CII patents represent 32% of total patent filings at IPA, a lower share than at the USPTO (50%) and at the EPO (41%), partly reflecting differences in technology mix
- Australia sits between the European Union (EU) and United States (US) in granting patents at the margins of patent subject matter eligibility (applying Australia's standards)
 - » Where a filed patent is for a CII invention at the margins of eligibility it is around 18% less likely to be granted by IPA, 7% less likely to be granted by the USPTO, and 24% less likely to be granted by the EPO.
- Applicants who have filed a patent at the USPTO are half as likely to file for an equivalent patent at IPA if it is for a CII invention at the margins of subject matter eligibility. However, the impact is partially mitigated where the patent has high technological and economic value
- In Australia, the 2014 court decisions reduced the grant likelihood of CII patents at the margins of subject matter eligibility by 12%
- Post-2014, past applicants for CII patents in Australia were up to 23 percentage points less likely to file for additional CII patents in Australia. Domestic applicants were among the least impacted, and the shift appears to reflect both reduced CII patenting and change in patent drafting/focus.

About the study

The project constructed a comprehensive database of patents relating to computer implemented inventions ("CII patents") filed at IPA, the EPO and the USPTO from 2010 to 2020 (with study period chosen to minimize data truncation bias). Overall, the sample comprised 524,879 applications filed at IPA, 2,839,709 filed at the EPO and 10,105,616 filed at USPTO.

"CII patents" broadly defined were identified by searching for select keywords in the title, abstract, claims and/or description of patents, and by filtering patents based on their International Patent Classification (IPC) technology codes.

Supervised machine learning models were developed to identify CII patent applications which are similar to those that have received a patentable subject matter objection in Australia. Full description of the methodology and data are available in the research report.

Key highlights

CII patents represent a lower share of overall patent filings in Australia compared to the US and EU. CII patents represent 32% of total patent filings in Australia, a lower share than in the US (50%) and at the EPO (41%). In Australia, 6% of total patent filings are for CII invention at the margins of patent subject matter eligibility – similar to those that receive a manner of manufacture objection during examination.

Computer technologies have driven similar significant growth in CII patenting across jurisdictions. However, CII patents are concentrated across range of technology areas including computer technology, digital communication, measurement, medical technology and telecommunications. Growth was driven also by IT methods for management across Australia and the US prior to the mid-2010s.

Australia is closer to the USPTO than the EPO granting patents to CII inventions on the margins of patent subject matter eligibility.

IP Australia grants 54% of CII applications that are likely to receive a patentable subject matter objection in Australia, based on 2001-2020 data. This is a higher share than the EPO (27%) but lower share than the USPTO (68%).

The study analyses outcomes for patents with equivalents (for the same or similar inventions) filed across jurisdictions. Where patents are filed for CII inventions at the margins of eligibility, they are 18% less likely to be granted at IPA, 7% less likely to be granted by the USPTO, and 24% less likely to be granted by the EPO (compared to the grant rate of non-CII applications when filed at each office). The results indicate that Australia is between the European Union and United States in the restrictiveness of its legal standards.

After filing an application at the USPTO, applicants are less likely to file an equivalent patent in Australia if it for a CII, but the effect is partially mitigated for higher value patents.

On average, an applicant who filed for patent protection at the USPTO has a 6% likelihood of filing a follow-up patent application in Australia. If the invention is CII at the margins of eligibility, that probability is halved, at 3%. This is a pattern not observed for applicants who file first at the EPO, and the effects vary with applicant and invention characteristics.

A key function of the patent system is to facilitate international technology transfer and ensure that domestic firms and consumers have access to technologies at the global frontier. A common proxy indicator for the technological and economic value of a patent is the number of assignee countries from which the patent's applicants originate. For CII patents at the margins of subject matter eligibility, each additional assignee county is linked to a 67% increase in its likelihood of being filed in Australia following its filing at the USPTO (a 2 percentage point increase on a 3 percentage point base rate).

The impact on CII filings of legal standards relating to patent subject matter eligibility may be partially mitigated by patent value.

Following significant court decisions in 2014, the likelihood of grant for CII applications in Australia fell. So did the propensity of past applicants to file more CII patents in Australia. In this behaviour, domestic innovators were among the least impacted.

The 2014 court decisions clarifying and shifting the margins of patent subject matter eligibility for CII had different effects across jurisdictions and for different applicants.

For CII patents similar to those that would receive a manner of manufacture objection, their grant likelihood in Australia fell by around 12% following the 2014 court decision in *Research Affiliates LLC v. Commissioner of Patents* [2014]. Based on this study's data, this was not a pattern observed for similar applications filed in the US or EU, despite the documented impacts of *Alice Corp v. CLS Bank International* [2014].

For applicants who had filed a CII patent in Australia prior to 2014, the court ruling that year led to a 10–23 percentage point reduction in their likelihood of filing a follow-up CII patent in Australia, compared to IPA applicants who filed non-CII patents prior to 2014.

More than half the reduction in CII patenting can be attributed to applicants ceasing patenting in Australia. This is particularly true for Australian (domestic) applicants. However, in their CII filing propensity, domestic innovators were among the least strongly impacted by the 2014 decision.

Among those applicants that have continued to file patents with IPA, for those that patented inventions that would likely receive a manner of manufacture objection, there is some indication they have substituted away from filing such patents post-2014, adjusting their patent focus.


Significance and future research

In summary, the report suggests that patenting of CII in Australia is not significantly out of step with other jurisdictions, and is positioned between the European Union and United States in the restrictiveness of its legal standards.

Nevertheless, the report provides evidence that change in legal standards within Australia, for example with the decision in *Research Affiliates LLC v. Commissioner of Patents* [2014], has resulted in a decline in CII patent applicants electing to seek protection in Australia.



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