AN EMPIRICAL STUDY OF BUSINESS METHOD PATENT APPLICATIONS FILED IN AUSTRALIA 2000-2009

BEN MCENIERY*

Abstract

This article sets out the results of an empirical research study into the uses to which the Australian patent system is being put in the early 21st century. The focus of the study is business method patents, which are of interest because they are a controversial class of patent that are thought to differ significantly from the mechanical, chemical and industrial inventions that have traditionally been the mainstay of the patent system. The purpose of the study is to understand what sort of business method patent applications have been lodged in Australia in the first decade of this century and how the patent office is responding to those applications.

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* BA, LLB (Hons) (UQ), LLM (QUT), PhD (QUT), Senior Lecturer, Faculty of Law, Queensland University of Technology, Barrister-at-Law, Brisbane. I would like to acknowledge: IP Australia for providing data used in the study; Professor Norman Siebrasse and Dr Daniel Belavy for comments made in respect of an earlier version of the paper; Professor Mark Lemley for advice regarding the scope of the study given during the project’s formative stages; and Andrew Trotter and Jimmy Ti for research and administrative assistance. All errors are my own.
This article reveals the results of an empirical study of business method patenting in Australia between 2000 and 2009. It seeks to demonstrate some of the contemporary trends in patenting by identifying characteristics of patent applications for business methods that have been filed in Australia and observing how the patent office has responded to those applications.

The push to patent business methods began in earnest worldwide after the United States Court of Appeals for the Federal Circuit (‘Federal Circuit’) handed down its decision in *State Street Bank & Trust Co. v Signature Financial Group, Inc.* (‘State Street’)\(^1\) in 1998. In that case, the revered Judge Giles Rich, categorically rejected the notion that business methods are a class of subject matter that is excluded from patent eligibility.\(^2\) Rich J’s view in this regard has since been adopted as good law in Australia. Firstly, Heerey J confirmed in *Welcome Real-Time SA v Catuity Inc.*,\(^3\) that there is no business method exception in Australia.\(^4\) Secondly, Heerey J’s statement of principle was endorsed in *Grant v Commissioner of Patents* (‘Grant’).\(^5\)

Despite Rich J’s emphatic endorsement, business method patenting remains controversial. The polarising of opinion in regard to patenting this kind of subject matter was demonstrated when the United States Supreme Court in its 2010 decision in *Bilski v Kappos*\(^6\) upheld their validity as an accepted category of patentable subject matter by the narrowest of majorities (5-4).\(^7\) While the future of business method patenting is far from assured following the divisive views emanating from the United States Supreme Court, it is safe to assume those seeking patents for business methods will continue to file undeterred, especially as there has been no similar judicial criticism here in Australia.

Despite the controversy, and in some quarters, the outright opposition to business method patents,\(^8\) we know very little about business method patenting practices. This article is designed to improve our understanding of those practices by examining a random selection of patent applications for business methods filed in Australia after the *State Street* decision was handed down. To accomplish this, 200 patent

\(^2\) Ibid 1375 (holding that there never had been a patentable subject matter exception for methods of doing business) affirmed in *AT&T Corp v Excel Communications, Inc.*, 172 F.3d 1352, 1355 (Fed. Cir. 1999) and *In re Bilski*, 545 F.3d 943, 960 (Fed. Cir. 2008) (*en banc*).
\(^3\) (2001) 113 FCR 110.
\(^4\) Ibid 137-8.
\(^6\) 561 US ___ (2010).
\(^7\) The patent eligibility of business methods was split in favour of a slender 5-4 majority. The majority, consisting of Kennedy J, Roberts CJ, and Thomas, Alito and Scalia JJ, opined that business methods are not excluded from the scope of patentable subject matter. The minority, Stevens, Ginsburg, Breyer and Sotomayor JJ, held that they are a category of excluded matter.
applications for standard patents\textsuperscript{9} claiming business methods lodged in Australia between 2000 and 2009 were analysed and a large number of facts about each of these patent applications were identified.

Among other things, the study identifies: who is obtaining patents, in terms of nationality and entity type; where the inventors are from and how many contribute to each invention; what areas of technology the inventions considered fall within; the number and type of prior art citations; whether the application is a divisional parent or child; whether the invention involves a physical embodiment; whether the claims contain one or more claims to computer software; and the technology area of the invention. The study also tests a number of the relationships between the applications, such as relationships between applicant domicile, applicant entity type and the number or type of prior art citations. This is done in the hope of advancing the understanding that both scholars and practitioners have about modern trends in terms of the sorts of inventions that patent applicants are seeking monopoly protection in respect of.

One of the principal motivations behind this study was to identify the number of patent applications for business methods filed during the sample period that satisfy the physicality requirement introduced into Australian law in 2006 in \textit{Grant}, and how the Patent Office is responding to claims of that kind. In \textit{Grant}, the Full Federal Court (comprising Heerey, Kiefel and Bennett JJ) considered the patentability of a means of structuring a financial transaction to protect an individual’s assets from the claims of creditors – which is a non-physical business method.

In doing so, the Full Court held that a method or process invention must involve a ‘physical effect’ if it is to fall within the scope of patentable subject matter. The court expressed this physicality requirement in the following terms:

\begin{quote}
A physical effect in the sense of a concrete effect or phenomenon or manifestation or transformation is required.\textsuperscript{10}
\end{quote}

The court also said:

\begin{quote}
It is necessary that there be some “useful product”, some physical phenomenon or effect resulting from the working of a method for it to be properly the subject of letters patent. That is missing in this case.\textsuperscript{11}
\end{quote}

The court in \textit{Grant} was of the view that there is no prohibition on patenting business methods in Australia,\textsuperscript{12} so long as the methods involve the use of a physical device, or are in some way physically transformative.

\textsuperscript{9} In Australia, there are two types of patent: standard patents, which remain in force for a term of 20 years; and innovation patents, which remain in force for a term of eight years: \textit{Patents Act 1990 (Cth)} ss 67-68.

\textsuperscript{10} (2006) 154 FCR 62, 70.

\textsuperscript{11} (2006) 154 FCR 62, 73.

While it has been argued that the Federal Court’s physicality requirement is inconsistent with existing High Court precedent and is therefore not good law,13 Grant now represents the accepted law in this country.

It is of interest to note that the Australian law on this point is not consistent with the law in the United States. The United States Supreme Court in Bilski v Kappos rejected the view that United States law contains a physicality requirement when it held that the ‘machine-or-transformation test’ formulated by the Federal Circuit below is not the sole test for determining patent-eligibility.14 The Australian law would, however, appear to be consistent with the law in Canada.15

One of the peculiarities of the Grant decision is the court’s view that the physicality requirement will be satisfied when a method implemented in computer software runs on or in conjunction with a physical device, such as a general purpose computer. The court took the view that a change in state or information in a machine, or part of a machine, is a physical effect of the requisite kind.16 The court said:

In Catuity and CCOM as in State Street and AT&T, there was a component that was physically affected or a change in state or information in a part of a machine. These can all be regarded as physical effects.17

In the author’s view, the Federal Court’s finding in Grant that a change in state or information in a part of a machine is a physical effect of the requisite kind is questionable. The author is of the opinion that software running on a general purpose computer is an inherently non physically-transformative technology because the inventive contribution made in a new computer software program is the information processing method the software achieves, not the operation of a machine that forms part of the prior art base.18 Furthermore, the author is of the opinion that this aspect of the Grant decision is inconsistent with CCOM v Jiejing,19 which provides for the patentability of computer software without reference to a physicality requirement.

In light of the court’s decision in Grant, it was thought prudent to investigate the extent to which those seeking business method patents in Australia have either drafted patent specifications and claims that satisfy the physicality requirement or have disregarded it and attempted to patent anyway; and the extent to which the physicality requirement has been enforced by the Patent Office.

A selection of the inventions considered in the study is listed here. They include:

II Existing Literature

There is a small amount empirical research that has been done in Australia into the uses to which the patent system has been put. However, empirical analyses carried out in Australia tend to focus on litigated patents, rather than what people are trying to patent and how the patent office has responded to those attempts. Further, there appear to be no Australian empirical studies that specifically address business method patents.

Weatherall and Jensen conducted an empirical study of patent enforcement outcomes that gives a broad picture of what is happening in patent disputes in the courts. They addressed the frequency of litigation, length of proceedings, rates of success, the grounds for findings in respect of patent validity, the proportion of cases which were appealed, and appeals which were successful. Dent and Weatherall gathered empirical evidence relating to the extent, timing and outcomes of settlement of patent litigation in Australia, and the factors considered by lawyers when advising their clients on settlement decisions. Rotstein and Weatherall examined the nature of the cases that go to court. Considering the number of patents in force, they concluded that the amount of patent litigation was not significant, and noted that in any event, patent litigation was far more likely to settle than proceed to judgement.

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Much more empirical analysis of the patent system has been undertaken by scholars in the United States. In their study, *Who’s Patenting What? An Empirical Exploration of Patent Prosecution*, Allison and Lemley used a random sample of a thousand patents issued between June 1996 and May 1998 to gain a thorough understanding of the nature of the characteristics patents being issued – including the area of technology, country of origin, number of inventors, nature of assignee, time spent in prosecution, amount and type of prior art cited, and the number of claims – and correlations between these factors.

There have been a number of empirical studies from the United States that address business method patents. Three studies have provided particularly detailed analyses of specific categories of business method patents. First, Allison and Tiller examined patents relating to Internet business methods. This article was a response to the prevalent criticisms of the quality of business method patents, of which the Internet-based patents were considered to be the most controversial. The authors concluded that there is no evidence that business method patents are statistically different from other patents or of any lesser quality – finding no deficiency in type or amount of prior art cited, no evidence that internet business method patents might undergo a merely cursory prosecution process as compared to other patents, and no significant differences in the number of claims they contain or the number of inventors which contribute to the inventions. Second, Lerner examined business method patents related to financial operations. Lerner compared 100 randomly selected finance-related patents with two other sets of 100 random general patents. Again, he found that there was no shortage of prior art cited in finance patents, no shortage of rejection prior to issuance and no sign that finance patents moved through the system with any more speed than other patents. However, Lerner identified one issue which could be attributable to the allegedly inferior quality of these business method patents: the experience and qualifications of the examiner. Third, Hunter examined a broader range of data to respond to two central criticisms of business method patents: that they are too broad in scope, and that they are inferior in quality. To evaluate the first of these objections he analysed differences in the number of patent and non-patent prior art references in each respective type of patent; to address the second he investigated whether there were any more or less claims in business method patents as compared to the average. The data presented no trends to support either conclusion.

III Methodology

The study involves an examination of a random sample of 200 patent applications for standard patents that claim a business method and were filed in Australia between 2000 and 2009.  

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35 This eligibility criterion includes PCT applications filed before the year 2000 which did not enter the national phase in Australia until 2000. It was noted that in some instances, the IPC mark on the patent applications themselves was different to that recorded in IP Australia’s AUSPAT database. Where
IP Australia kindly provided data necessary for the study. This included a list of all 10,592 patent applications filed in Australia with a first International Patent Classification (‘IPC’) mark of G06F or G06Q between 2000 and 2009. The data was generated on 16 November 2010 (the ‘sample date’).  

A IPC Classes

Patent applications filed with a first IPC mark of G06F or G06Q were included because these are classification marks generally associated with applications claiming business methods. The IPC system is a means for standardising the way in which patent applications are classified and catalogued by patent offices. When a patent application is filed, it is classified according to the field of technology with which the invention is most concerned. Most offices worldwide, including the Australian Patent Office, use the IPC system. A notable exception in this regard is the United States Patent and Trademark Office (‘USPTO’), which has developed and uses its own classification system.

Upon filing, an invention is allocated a primary mark that denotes the classification of what is perceived to be its core concept. Additional marks may be allocated to capture peripheral aspects of the invention. IPC marks G06F or G06Q are those nominally reserved, among other things, for business methods. IPC class G06F concerns ‘electric digital data processing’; IPC class G06Q is devoted to ‘data processing systems or methods, specially adapted for administrative, commercial, financial, managerial, supervisory or forecasting purposes; systems or methods specially adapted for administrative, commercial, financial, managerial, supervisory or forecasting purposes, not otherwise provided for’. These are, however, not the only IPC marks associated with business methods as not all patent applications claiming business methods are filed with a first IPC mark of G06F or G06Q, and not all patent applications filed with a first IPC mark of G06F or G06Q are for business methods. In any event, narrowing the data sample to applications that have a first IPC mark of G06F or G06Q is a reliable means of ensuring that the majority of applications contain claims to business methods.

B Business Methods

One of the inevitable difficulties in conducting a study of business method patents, is that ‘business method’ is a term that is notoriously difficult to define and, in many ways, is probably a misnomer. There are two attributes of the expression that stand out. Firstly, it describes what is essentially a commercial activity, and secondly, it describes a process rather than an apparatus or an artefact. While this seems straightforward, it is not easy to distinguish between methods of doing business and

there was an inconsistency, the IPC marks were taken to be those recorded in the AUSPAT database, rather than the patent application.

36 A sample of 200 patent applications taken from a total population of 10,592 applications represents 1.9% of the total population. The sample contained 128 applications with a first IPC mark of G06F and 72 applications with a first IPC mark of G06Q.

37 As Newman J observed in *In re Shrader*, the concept of a business method is “fuzzy” and “an unwarranted encumbrance to the definition of statutory subject matter”: *In re Shrader*, 22 F.3d 290, 297-298 (Fed. Cir. 1994) (Newman J dissenting).
tools or techniques useful in conducting business. In any event, it is sufficient to say a business method is an artificial process in which the inventive element lies in entrepreneurial strategy and includes a method that is useful in a business and a method designed to run existing aspects of business more efficiently or profitably than before.38 Despite the definitional difficulties, it remains a term that people use to describe patents with certain characteristics. A business method is not a field is technology of its own in the way that physics or chemistry is. It might be said that business methods are a general purpose technology, such that a single business method might be useful in a wide range of applications, in a wide range of industries or as a component of a large number of other technologies.

As the focus of the study is business methods, applications that solely claim devices or apparatus were not considered. However, applications that involve both method and apparatus claims were included, because these are applications that involve business methods. Any patent application that claims a method that was obviously not a business method was removed from the sample.

The sample only contained patent applications that were accessible to the author. In this sense, the scope of the study is restricted to those applications that are open to public inspection (‘OPI’) and written in English. Applications that have been laid open to public inspection are those that are have been published by the patent office and can be freely inspected by members of the public. In Australia, as in most jurisdictions, a patent application is made open to public inspection 18 months after the application is filed.39 Until that time, the application is held by IP Australia in secret and is not publicly available.

The patent specifications included in the study were downloaded from IP Australia’s online patent database, AUSPAT.40

C  Data Collected

For each patent application in the sample, the following data were collected:

- the patent application number;
- the patent type (all are standard patents);
- the invention’s title;
- patent status (whether the application or patent was filed, sealed, lapsed, ceased, accepted, withdrawn or revoked);
- whether the patent is currently facing opposition proceedings;41
- the patent’s first IPC mark;
- the name or names of the inventor or inventors;

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39 Patents Act 1990 (Cth) ss 54-55.


41 Patents Act 1990 (Cth) s 59; Patents Regulations 1991 (Cth) Ch 5.
• the name or names of the patent applicant or applicants;
• whether the application was filed according to the processes established under the Patent Cooperation Treaty (PCT), and if so, the PCT application number;
• the application’s filing date;
• the national phase entry date;
• the application’s earliest priority date;
• the application’s divisional status (ie whether the application is a divisional parent or child);
• whether the applicant is of foreign or domestic domicile, and the country in which the applicant is domiciled;
• the application’s country of origin (which is based largely on where the inventors reside);
• the patent applicant’s entity type (company, individual, university or government/statutory body);
• the number of inventors;
• the number of prior art citations;
• the type of prior art cited (patent, non-patent or both);
• whether the invention involves a physical embodiment;
• whether the claims contain one or more claims to computer software; and
• the technology area of the invention (aside from being a business method).

Most of this data was extracted from the patent applications themselves. The remainder was easily derived from information in the applications. The main exception to this was that the applications in the study were classified into areas of technology defined by the author. Many of the categories of data are self-explanatory, however, explanation of some of the categories of data collected is desirable and is explained below.

1 Patent Status

Patent status describes whether the status of the application listed as filed, sealed, accepted, lapsed, ceased, withdrawn, or revoked.

Where a patent application’s status is listed as filed, this tells us that the application’s fate has not been decided by the patent office and that the application has not yet been abandoned by the applicant. This status includes both applications that are under examination and those that have not yet undergone examination.

An application that has been accepted is one that has passed an examination without lasting objection and has been accepted by the Commissioner of Patents, but has not yet been sealed. A patent is sealed only after the patent has been accepted and has successfully negotiated the following three-month opposition period in which third parties may raise protest against a patent being granted. Where a patent is sealed, it has been granted and not subsequently revoked by the Commissioner of Patents or a court. Once a patent is sealed, the patentee gains the right to sue in respect of acts

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42 Patents Act 1990 (Cth) s 49.
43 Patents Act 1990 (Cth) s 61.
44 The patentee or any other person can request re-examination and the Commissioner of Patents can revoke a patent after re-examination: Patents Act 1990 (Cth) s 101.
constituting a patent infringement that occur after the publication of the patent specification.\textsuperscript{45}

An application that has been withdrawn has been voluntarily withdrawn by the applicant.\textsuperscript{46} A patent application will lapse if an applicant fails to attend to a particular action, such as the payment of a fee, by the necessary deadline.\textsuperscript{47} A standard patent ceases if the patentee does not pay a renewal fee for the patent within a necessary period or does not file a prescribed document (if any) within a necessary period.\textsuperscript{48}

2 Divisional Status

An application’s divisional status concerns whether the patent is divisional parent or child. A divisional patent application allows a patent applicant to divide a patent application into two applications where he or she has described more than one invention in a complete specification.\textsuperscript{49}

3 Country of Origin

Determining the application’s country of origin concerns identifying the nation in which the invention originated. This was determined by looking at the inventor’s or inventors’ domicile, with the applicant’s domicile used as a sort of “tie-breaker.”\textsuperscript{50}

4 Number of Prior Art Citations

The value in counting the number and type of prior art citations in a patent application is that the number and type of prior art references appear to relate directly to patent quality (and thus value).\textsuperscript{51} As Allison and Tiller note, “Patent quality is an elusive concept, but it essentially consists of the likelihood that a patented invention meets the requirements of novelty and nonobviousness, and thus will be found valid if challenged in litigation.”\textsuperscript{52} When patent applicants expend time, effort, and money conducting thorough prior art searches to differentiate their inventions from others, they likely do so in the belief that their inventions are of value. It can be inferred then, that clear differentiation from the prior art leads to more valuable patents that have a better chance of withstanding challenges.

Further, the alleged failure of business method patents to properly cite prior art is the basis of much criticism of business method patents.\textsuperscript{53}

In this study, as in other studies, no attempt was made to verify the relevance, usefulness or appropriateness of the prior art cited.

\textsuperscript{45} Patents Act 1990 (Cth) s 120.
\textsuperscript{46} Patents Act 1990 (Cth) s 141.
\textsuperscript{47} Patents Act 1990 (Cth) s 142.
\textsuperscript{48} Patents Act 1990 (Cth) s 143. The Act has provisions which allow for the restoration of a lapsed or a ceased patent.
\textsuperscript{49} Patents Act 1990 (Cth) chapter 6A.
\textsuperscript{50} Allison and Lemley, above n 31, 2115-2116.
\textsuperscript{51} Allison and Tiller, above n 32, 998.
\textsuperscript{52} Ibid 996.
\textsuperscript{53} Ibid 998.
5 Whether the Invention Contains Physical or Non-Physical Claims

Given that the Grant decision lacked any sufficient detail regarding the particulars of the physicality requirement the court introduced, and the fact that the decision has not been considered in any subsequent decision of an Australian court, it is unavoidable that there will be some disagreement as to what the scope of the physicality requirement is. In any event, the following explains the criteria used in this study to test whether the inventions in the sample would satisfy the Grant physicality requirement.

Categorising an invention’s claims as physical or non-physical involves ascertaining whether the claims are in respect of physical or non-physical embodiments, or both. The inventions in the sample were categorised according to whether they contain only ‘physical’ claims, only ‘non-physical’ claims, or ‘both’ physical and non-physical claims. In this sense, ‘physical’ claims are those that are embodied in a machine or other physical device, or have a physical effect in the sense that they physically transform matter in some way. Claims that are ‘non-physical’ are those lacking the characteristics of ‘physical’ claims. Inventions that are described as involving ‘both’ physical and non-physical claims are those: that contain claims to both ‘physical’ and ‘non-physical’ embodiments (which is not an uncommon drafting technique); or one or more claims that could conceivably be implemented in a physical or non-physical way.

Claims that are embodied in a machine or other physical device are apparatus claims in which the invention claimed is a new physical artefact or an improvement of an existing physical artefact known in the prior art base. Given that this is a study of business method patenting, claims embodied in a machine or other physical device (where the machine or device is claimed and is part of the inventive concept) are not considered.

Classification as a ‘physical’ process or method claim demands that the claims have a physical effect in the sense that they physically transform matter in some way. When considering claims of this sort, it is important to distinguish claims that merely make use of physical matter without actually transforming it. Mere use of a known existing physical object does not qualify, unless the use of that object according to the method claimed physically transforms some object or matter.

Insofar as computer software claims are concerned, in line with the Federal Court’s decision in Grant, claims that involve a change in state or information in a part of a machine are considered to be ‘physical’ claims. In this connection, the following are considered to involve a physical transformation: execution of software stored on a general purpose computer or in computer memory; recording or storing data or instructions on a computer, in computer memory, or on any other computer readable medium; transformation of data stored on a computer, computer memory or on any other computer readable medium; a method that involves generating information in a human-readable format, say in a form that is printed on paper or displayed on a screen.

54 The alleged invention considered in Grant (which is explained in section I above) is an example of a ‘non-physical’ invention.
According to the law in Australia as it currently stands, there is no need for any physical change occasioned by the operation of the method to be integral to the inventive step the application discloses. Unlike the position in the United States, there is currently no explicit statement in Australian law that insignificant post-solution activity will not render otherwise unpatentable subject matter patentable. In the United States, appending ‘insignificant post-solution activity’ to otherwise unpatentable subject matter will not make that subject matter patentable. The principle requires that the invention, being the advance over the prior art, be identified and extracted from any superfluous material contained in the description of the invention or claims that would otherwise obscure the true scope of that which goes beyond matter already forming part of the prior art.\(^{56}\)

6 One or More of the Claims are Software-Based

This aspect of the study was designed to identify what proportion of business method patent applications claim methods that are automated by, or otherwise embodied in, software. To this end, the number of patent applications in the study that contained one or more claims directed to computer-readable instructions encoded in software was counted.

There are, of course, many examples of claims that are drafted in this way. An example of such drafting, taken from one of the granted patents considered in the study, is as follows.

A computer readable storage medium having stored thereon program code configured for executing…\(^{57}\)

It is noted that, despite what the Full Court said in Grant, a method that makes use of an existing general purpose computer or computer network does not necessarily incorporate that computer or network in the inventive process.

7 Technology Area

Rather than simply categorising the applications in the sample as business methods, the inventions were sub-categorised into eight classes according to the technology area into which they fall. This is an attempt to identify what the heart, or the primary contribution to the state of the art of the claimed inventions is.\(^{58}\) This is done for the purpose of understanding what sorts of innovations are labelled as business methods.

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\(^{56}\) Parker v Flook, 437 US 584, 590 (1978) affirmed In re Bilski, 545 F.3d 943, 962 (Fed. Cir. 2008) and Bilski v Kappos, 130 S.Ct. at 3230 (2010); Diamond v Diehr, 450 US 175, 193 n 14, 191-192 (Rehnquist J), 215 (Stevens J). Although not a decision of a court, it is noted that this view of how the Full Federal Court's physicality requirement has been adopted by the Patent Office. See Invention Pathways Pty Ltd [2010] APO 10 (a method for commercialising inventions that includes the step of applying for patent protection), which was followed in First Principles Inc [2011] APO 1 (a method of psychological analysis and therapy). For an academic commentary which supports this approach see Ben McEniery, ‘The Patentability of Non-Physical Inventions: Lessons from the Unites States’ (2009) 35(2) Monash University Law Review 376, 421.

\(^{57}\) Australian Patent No. 2003236611 (filed 11 July 2003), claim 44. This is an example of a Beauregard claim. The Beauregard claim form is to claim ‘computer programs embodied in a tangible medium.’ In re Beauregard, 53 F.3d 1583 (Fed. Cir. 1995).

\(^{58}\) See Allison and Tiller, above n 32, 1028.
As Allison and Lemley point out, attempting to define areas of technology in this fashion is as much an art as a science. Some might reasonably disagree with the following categories or definitions, it is submitted that these categories are as reasonable as other possible alternatives.

The following categories were devised to classify the various applications in the sample. The classifications are exclusive, meaning that each invention that is considered as part of this survey is classified as falling with one, and only one, of these categories. The categories describe inventions that, in addition to being business methods, can be classified as:

- financial services or transactions;
- information dissemination or advertising methods;
- information management methods;
- information or computer security methods;
- computer network related methods;
- legal methods;
- business schemes or processes; or
- software.

Inventions that are financial services or transactions are those that implement some sort of financial product, service or transaction, or disclose a means of conducting a financial transaction. They include: automated transaction processing and transaction settlement systems; commodities or other trading systems; pricing systems; hedging strategies; trading strategies; customer loyalty schemes; transaction validation or verification methods; purchase order systems; and inventory management systems.

Inventions in the information dissemination or advertising category are those that describe means of communicating or disseminating information to the public or a section of the public.

The information management category is a broad category that describes inventions that implement or automate the delivery, storage, management, verification, acquisition, protection, transformation or translation, or analysis of information.

Inventions in the information or computer security category are those that describe such things as authentication systems, including biometric authentication systems, computer firewall systems, software security control systems and methods, and means of secure data transmission.

Allison and Lemley, above n 31, 2109.

The categories differ to those selected by Allison and Tiller, above n 32, 1028-1031. The categories selected by Allison and Tiller are: acoustics, automotive-related, biotechnology, chemistry, communications-related, computer-related, electronics, energy-related, mechanics, medical devices, optics, pharmaceutical, semiconductors, and software.

Inventions that fall into the *computer network related* category include those that describe means of effectively or efficiently communicating information or distributing services across computer networks to achieve particular aims, techniques for arranging the components that constitute a computer network, and means of managing computer networks, both wired and wireless.

*Legal method* inventions are methods of applying the law in a particular way and other means of structuring legal rights and obligations.\(^{62}\)

Inventions that describe *business schemes or processes* are inventions best categorised as a way of doing business, and include means of structuring a business, ideas for new businesses, means of conducting commerce (including electronic commerce), and business process schemes.

Inventions in the *software* category are those embodied in software, where the inventive contribution to the state of the art is best described as an advance in the art of computer programming (or an improved programming technique). Omitted from this category are innovations in computer hardware design, which do not involve software innovation.

**IV RESULTS**

A *Who is Seeking Patents for Business Methods in Australia?*

The majority of applications were filed by corporate entities (88%). Individual inventors filed 8.5% of applications, university applicants filed 2% of applications, while 1% of applications were filed by governmental or statutory bodies.\(^{63}\)

Foreigners filed the vast majority of the applications in the sample. Of the 200 applications considered, foreign applicants filed 170 of the applications. The number of foreign applicants that are private companies is 155, whereas only 13 of the foreign applicants whose applications were considered are individuals and two are universities.

In contrast, domestic applicants filed only 30 of the 200 applications. Of the domestic applications, 21 were lodged by private corporate entities, four were lodged by individuals, two were lodged by domestic universities, and two were lodged by governmental or statutory bodies.

The applications considered originated in 20 countries. A statistic indicative of Australia’s status as a net importer of technology is that the vast majority of applications filed originated in countries other than Australia. More than 80% of the applications considered originated in just three countries. By far the largest source of business method patents filed in Australia in the sample is inventions that originated in the United States, which represented 56.6% of the sample. Second, were inventions

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\(^{62}\) According to the court, the invention considered in *Grant* is a legal method concerning ‘actions of financial and legal consequence’: *Grant* (2006) 154 FCR 62, 64.

\(^{63}\) One application (0.5% of the sample) was filed by an entity whose type is not capable of description. It is appears that the applicant’s name was not recorded correctly on the patent application: see Australian Patent Application No. 2006228992.
that originated in Australia (20.5%). This is an interesting statistic in itself, because it reveals that 11 of the 200 applications originated from Australian inventors, but were filed by foreign applicants. This suggests that foreigners are appropriating a fair degree of Australia’s domestic ingenuity, insofar as patenting business methods is concerned. The third largest source from which applications originated was Great Britain, which accounted for 6% of the sample.

The remaining sources, in terms of country of origin are as follows. Seven applications came from Japan. Israel and France contributed four each. Three were from our neighbours in New Zealand. Korea, Norway and Sweden contributed two each. Canada, China, Germany, Greece, India, Ireland, Malaysia, Philippines, Singapore, South Africa were each the source of one invention. Anecdotally, it can be said that a disproportionately large number of inventors of the applications considered reside in the San Francisco Bay area, in places such as Menlo Park, Los Altos, San Mateo and Santa Clara.

B Use of the PCT

Most applications were filed using the PCT international patent application process. Of the 200 patent applications, exactly 150 were PCT applications. Foreign applicants filed 90% of those, while foreign corporate applicants filed 80%. 17.5% of foreign applicants chose not to avail themselves of the PCT and filed using national applications instead. Exactly half of the 30 applications filed by domestic applicants were filed using the PCT. Of the PCT applications filed by domestic applicants, 11 were filed by corporate applicants, two were filed by universities, and only one was filed by an individual.

Heavy use of the PCT indicates that applicants who seek patents for inventions in Australia also seek patents for the same inventions in other jurisdictions. That half the domestic applicants filed using the PCT suggests Australian innovators seeking business method patents are seeking patents in multiple jurisdictions and not just in their own country.

C Application Status

Application status indicates the point in their life spans that the patent applications in the study had reached at the sample date. This is not an observation as to the characteristics of the inventions claimed, but an observation regarding the data used in the study.

The study considered patents at different points in along their life spans. 29.5% of the applications had been sealed, 2% had been accepted but not yet sealed, 34.5% had lapsed, 6% had ceased, one application had been withdrawn, and none had been granted and then revoked. The remaining 27.5% had been filed and had no other

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64 This could be a result of Australian inventors being employed by foreign entities and those foreign entities having an entitlement to any rights in the inventions by virtue of the employment relationship. Alternatively, it could be the result of Australian inventors voluntarily assigning the rights in their inventions to foreign entities, presumably in exchange for some valuable consideration.
status event associated with them. None of the applications in the sample were facing opposition proceedings at the date the sample was taken.\textsuperscript{65}

\section*{D Divisional Status}

23 of the applications considered are either divisional patents or children. Nine of the applications in the sample are divisional parents, 12 are divisional children and two are both a divisional patent and child.

Foreign corporate applicants appeared to most readily make use of divisional applications. The number of divisional applications filed by foreign applicants (19) outnumbered those filed by domestic applicants (4). Similarly, the number of divisional applications filed by company applicants (20) outnumbered those filed by individuals (2). The vast majority of applicants filing divisionals were foreign companies (18).

Approximately half of the divisional applications filed were filed using the PCT (11), while the remainder (12) were filed as national applications.

\section*{E Number of Inventors}

The majority of inventions were not invented by lone inventors, but by small teams of inventors, which reflects the trend that innovation in modern times is largely a collaborative endeavour. One third of inventions in the sample were invented by a sole inventor (33.5%). 27.5\% were created by teams of two inventors. 15.5\% were created by teams of three inventors. 20.5\% were created by teams of between 4 and 10 inventors. Only 1.5\% were created by teams of more than 10 inventors.\textsuperscript{66} The average number of inventors per application was 2.7. The median number of inventors was two. The largest number of inventors was 13.

\section*{F Prior Art Citations}

Overall, the applications contained very few prior art citations. The majority of applications in the sample (62.5\%) contain no prior art citations. Approximately one-third of the applications contain between one and 10 prior art citations (36\%), while at least half contain between zero and two citations.\textsuperscript{67} In only 1.5\% of the applications are more than 10 prior art citations made.\textsuperscript{68} The small number of prior art references

\textsuperscript{65} That none of the applications were facing opposition proceedings at the sample date is unsurprising as only 4 of the 200 applications in the sample had been accepted but not yet sealed at the time the sample was taken. Opposition proceedings can only be brought within a three month window between the patent office accepting that a patent should be granted and the patent being sealed: \textit{Patents Act 1990 (Cth) s 59; Patents Regulations 1991 (Cth) Ch 5}.

\textsuperscript{66} In three of the 200 applications, the names of the inventors were not given, making it impossible to determine the number of inventors of those inventions.

\textsuperscript{67} The median number of prior art citations is 0, while the interquartile range is 2. When the results are sorted from lowest to highest, the median is the ‘middle’ value or the 50th percentile. The interquartile range, also called the midspread or middle fifty, represents the central 50% of the data from the 25th percentile to the 75th percentile.

\textsuperscript{68} These results appear to be inconsistent with the results relating to United States Internet business method patents obtained by Allison and Tiller, who found that, ‘with respect to prior art, Internet business method patents had significantly more patent references, nonpatent references, and total references than patents in general’: Allison and Tiller, above n 32, 1003. In this regard, it is important
is explainable by the fact that patent law does not require applicants to conduct a prior art search.

The largest number of prior art citations in a single patent application was 101 (these consisted almost exclusively of references to the applicant’s own earlier patents). Given the rest of the data, this must be regarded as an anomalous result. The second largest number of prior art citations was 37, and the third was 13. All other prior art citation counts were 10 or fewer.

Excluding the patent with 101 prior art citations, the sample contains a total of 280 prior art citations, giving an average number of prior art citations of 1.41. Interestingly, foreign applicants cited more prior art per application than domestic applicants. The average number of prior art citations made by foreign applicants is 1.44, while the average number of prior art citations by domestic applicants is 1.2 (ignoring the application with 101 prior art citations). However, there was no relationship between an applicant’s domicile and any reluctance or aversion to citing prior art. The percentage of foreign applicants that cited no prior art was 62.35%. Similarly, the percentage of domestic applicants that cited no prior art was 63.33%.

Applicants who did cite prior art showed a preference for citing patents and patent applications. In 65.3% of cases in which applicants cited prior art, they cited only patents and patent applications; in 18.7% of cases they cited only non-patent prior art; and in 16% of cases they cited both patent and non-patent prior art. These percentages can be explained by the fact that it is often easier and less expensive to search for prior patents and patent applications than it is to search for relevant non-patent prior art.

As far as prior art citations based on entity type is concerned, the data reveal that companies are more likely to cite prior art than individuals, and universities are more likely to cite prior art than both. The average number of prior art citations per application filed by a company was 1.42. 67 of the 176 applications filed by companies contain some 250 prior citations (excluding the one application with 101 prior art citations). On the whole, companies were more likely to cite patent and patent application prior art than non-patent prior art. Of the 67 patent applications filed by companies that cited prior art, 44 cited only patents and patent applications, 11 cited only non-patent prior art, and 11 cited both patent and non-patent prior art. In contrast, the average number of prior art citations per patent application filed by individuals was 0.82. The sample size in this regard is small, given that individuals cited only 14 items of prior art in four patent applications (out of a total of only 17 applications filed by individuals). Like all other applicants, individuals were more prone to citing patent prior art than non-patent prior art. In only one of these four applications was non-patent prior art cited. The average number of prior art citations per patent application filed by universities was 3.5. In total, there were 14 prior art citations in the four applications filed by universities.

to note that the studies conducted by both Allison and Tiller and Allison and Lemley, above n 31, were of granted patents, whereas the study documented in this article concerns patent applications, not all of which will become patents.
There was no correlation between the number of inventors and number of prior art citations.\textsuperscript{69}

G Technology Area

Insofar as technology areas are concerned, a majority of the applications (54\%) fall in the category of information management inventions. That is, they implement or automate the delivery, storage, management, verification, acquisition, protection, transformation or translation, or analysis of information.

Possibly the most significant statistic in terms of the technology areas the applications fall into is that the number of patents sought in the sample that actually concern a method of doing business or a business scheme (as opposed to methods that might be useful in a business) was extraordinarily small. Only 3\% of the applications considered were directed to business schemes or processes that describe a way of running a business.

This result is to some extent also borne out in the case law, or is at least unsurprising in light of the case law concerning business methods. \textit{Welcome Real-Time SA v Catuity Inc.},\textsuperscript{70} the case in which Heerey J acknowledged that there is no business method exception in Australia, involved a method and device for the operation of smart cards in connection with traders’ loyalty programs. The smart cards in question contain microprocessors or chips able to receive and store information. The problem to be overcome was that the smart cards have only ‘a small memory capacity’, which when using conventional ‘static’ methods to store information, only store loyalty points information in relation to a limited number of traders, being fewer than the number of traders who use loyalty programs. The invention overcame this problem by using a dynamic memory allocation technique so the cards could be used across thousands of merchants each operating their own proprietary loyalty programs.\textsuperscript{71} While his Honour described this invention as a business method, this is possibly a stretch: the true heart of the inventive concept is an improvement in the way information is stored on a physical data storage mechanism, rather than any improved method of doing business.

Similarly, the invention considered in \textit{Grant}, which involved a method of applying the law to create a scheme by which a trust is used to protect a person’s assets from the claims of creditors, is more a means of applying the law to achieve a particular aim than a business method as such. The business method considered in \textit{Grant} would fit within the ‘legal methods’ classification used in this study. In terms of specifically controversial subject matter of this kind, there was only one legal method (or method of applying the law in a particular way) – and that particular application had lapsed.

\textsuperscript{69} The correlation coefficient in respect of these two variables was 0.02, which indicates no correlation. A correlation coefficient is a value that lies within the range from -1 to +1 and indicates the strength of the relationship between two variables. Negative correlations indicate that higher values of one variable are associated with lower values of the other, whereas positive correlations indicate that both variables move in the same direction. A correlation approaching zero implies no relationship at all between the two variables considered.

\textsuperscript{70} (2001) 113 FCR 110 (Heerey J).

\textsuperscript{71} Ibid 116-7.
Interestingly, none of the applications in the sample contained legal methods for tax minimisation strategies.\(^72\)

There are 125 applications in the sample that contain software claims (62.5%). That is, nearly two-thirds of the applications filed seek to patent not just business methods, but business methods that are embodied in or automated by software. However, only 8.5% of the applications could properly be described as disclosing inventions in which the inventive contribution to the state of the art could best be described as an advance in the art of computer programming. More often, applications claiming computer software claim software as a means of implementing or automating a business process, rather than an improvement in the way software programs are coded or data structures are organised with a software program. In the context of computing, only 6% of the applications could properly be described as disclosing computer network related business method inventions.

12% of the applications disclose processes that were categorised as financial services or products or means of conducting financial transactions.

6.5% of the applications fall in the information dissemination or advertising category. It is interesting to note that 69% of applications in this technology area will not proceed to grant, because they had lapsed, ceased, or been withdrawn. This perhaps suggests that the applicants in question had little faith in patent applications of this kind.

9.5% of the applications fall in the information or computer security category. These included inventions such as, new means of user authentication, means of preventing unauthorised access to computer systems, and means of authenticating communications.

H Conformity with a Physicality Requirement

Perhaps the most interesting observation to be made from the data is the number of applications that do not involve a physical effect. Of the 200 business method patent applications considered, 75 contain non-physical claims – that is, either solely non-physical claims (59) or both physical and non-physical claims (16). In other words, more than one-third of the applications considered contain claims that do not conform to the physicality requirement established in *Grant*. The remaining 125 applications contain physical claims only as a consequence of having been implemented in computer software. That is, the only physical effect of these methods is a physical transformation taking place as a result of a change in state or information in a part of a machine.

The applications that contain non-physical claims should all be rejected, either in whole or in part, by the Patent Office. The survey results, however, suggest this is not happening. The Patent Office has accepted or sealed 18 patents for inventions that solely involve non-physical claims, and six patents that involve both physical and

non-physical claims. Thus in total, 24 patents in the sample that contain non-physical claims had either been accepted or sealed at the sample date.\textsuperscript{73}

It is also possible to analyse the patent applications that were filed after the Grant decision, which gives an indication of applicant behaviour in light of knowledge of the decision. 49 applications were filed after Grant was handed down. Of those 49 applications, 12 contain only non-physical claims, while four contain both physical and non-physical claims. Only three of the 49 applications filed after Grant was handed down had been accepted or sealed at the sample date. All three involved claims to physically-transformative computer software, which are patentable subject matter according to the principles espoused in Grant.

\textbf{V Conclusion}

This study of business method patenting in Australia at the start of the 21st century was undertaken to allow for a better understanding of the practices of those who seek patents for business methods, the trends in contemporary patenting practice and the responses of the patent office to those trends and practices to date. The data demonstrates some of the technologies inventors are seeking to patent at the dawn of the Information Age and some of the approaches they are taking in their attempts to do so. It is hoped that this study might be of assistance to practitioners, courts and policy makers, who need to use the law to meet the needs of clients, who need to understand how the system operates in practice before they can judge its effectiveness or evaluate whether it is in need of reform. The main findings of the study are as follows.

Although they all concerned business methods, the patent applications considered were also further categorised according to a classification scheme developed by the author. A majority of the applications (54\%), in addition to being business methods, concerned methods of managing or manipulating information. 12\% of the applications disclosed financial services or transactions. 9.5\% concerned means of providing information or computer security. Possibly the most significant statistic in terms of the technology areas the applications fall into is that the number of patents sought in the sample that actually concern a method of doing business or a business scheme (as opposed to methods that might be useful in a business) was extraordinarily small. Only 3\% of the applications considered could be classified as business schemes or processes.

Nearly two-thirds of the applications filed seek to patent not just business methods, but business methods embodied in or automated by software. Although a majority of the applications in the sample contain claims to computer software, fewer than 10\% of the applications in the sample fall within the software category used for the purpose of this study. More often, applications claiming computer software claimed software as a means of implementing or automating a business process, rather than an improvement in the way software is coded in a business environment.

\textsuperscript{73} Of this number, at the sample date, four patents in the sample that contain non-physical claims had been accepted but not sealed, while 19 had been sealed. In fairness to the Patent Office,
In terms of physicality, more than one-third of the applications considered contain claims that do not conform to the physicality requirement established in *Grant*. The remaining applications contain physical claims only as a consequence of having been implemented in computer software. That is, the only physical effect of these methods is a physical transformation taking place as a result of a change in state or information in a part of a machine occurring.

Most of the applications considered concerned inventions by individuals or very small teams of inventors. However, it was corporate applicants, rather than individuals or groups of individuals, that filed most of the applications. Only a very small number were filed by universities or governmental or statutory bodies.

Statistics indicative of Australia’s status as a net importer of technology are that the vast majority of applications in the sample were filed by foreigners and were for inventions created by foreign inventors. Foreign corporate applicants filed the vast majority of the applications. By far the largest source of business methods in the sample was inventors from the United States, however the second largest source was Australia.

Most applications were filed using the PCT international patent application process, which indicates that most applicants sought patents not just in Australia, but in many jurisdictions – including those filed by Australian applicants.

On the whole, the patent applications contained very few prior art citations. More than half the applications contained no prior art references at all. Of those that did cite prior art, they nearly all contained between one and 10 prior art citations. Most of the prior art that was cited consisted of other patents or patent applications. Approximately one-third of the applications contain between one and 10 prior art citations, while at least half contain between zero and two citations. Companies were more likely to cite prior art than individuals, and universities are more likely to cite prior art than both.