DO BUSINESS METHOD PATENTS ENCOURAGE INNOVATION?

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INTRODUCTION

Although the United States Patent and Trademark Office (“PTO”) had issued business method patents (“BMPs”) prior to 1999, the decisions of the United States Court of Appeals for the Federal Circuit (“Federal Circuit”) in State Street Bank & Trust Co. v. Signature Financial Group, Inc. in 1998 and AT&T Corp. v. Excel Communications, Inc. in 1999 led to a significant increase in the number of BMP applications filed with and granted by the PTO. Although grants of such patents have considerably stabilized in recent years, many policy issues raised by financial, electronic commerce and software companies in response to the State Street Bank and AT&T Corp. decisions regarding the patentability of business methods remain unanswered. Several legal and economic scholars, as well as the press, have examined this issue and have raised concerns about the quantity, quality and patentability of BMPs. There is some consensus in their point of views.

Many of these scholar works provide fairly detailed and systematic studies of individual cases and their implications. Comparatively, there is little literature on the effect of BMPs on innovation, which is grounded in a more comprehensive theoretical perspective and empirical approach. This paper endeavors to fill this gap by reviewing the extant literature on patents in general and attempting to draw inferences about the implications of this literature for BMPs. The paper primarily focuses on the role of patents in driving innovation and the effect of poor patent quality on innovation.

The remainder of the paper is divided into seven sections. Section I briefly outlines the history and economic rationale of the patent system. Section II discusses the history of BMPs in the United States. Section III sheds light on the provisions of the Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement regarding BMPs. Section IV briefly illustrates how different Member States of the World Trade Organization (“WTO”) have used the TRIPS agreement’s flexibility regarding BMPs in their national laws. Section V presents theoretical and empirical evidence about the general relationship between patent system and innovations, with analysis to understand the probable impact of BMPs on innovation. Section VI briefly presents the issues concerning BMPs and their consequences. Section VII presents a summary of the policy recommendations made by various scholars who have followed BMP’s evolution to becoming acceptable subject matter. The paper concludes with a brief discussion about some key policy recommendations for improving BMPs.

I. HISTORY, OBJECTIVE, AND ECONOMIC RATIONALE OF PATENT LAW

The English Statute of Monopolies (1623) is considered the origin of modern day patent law. Prior to 1623, British monarchs granted letters patent to faithful servants, merchants and traders, which were sold at exorbitant prices and created monopolies in various segments of the market. Abuse of these letters patent led to the Statute of Monopolies’s enactment in 1623 by the House of Commons, which restricted the monarch’s power to grant letters patents and put an end to the royal power to create monopolies. Nevertheless, the Statute of Monopolies allowed the House of Commons to grant patents to inventors for new inventions. The Statute of Monopolies became the basis of patent practice in England for nearly two centuries.

The birth of the patent system in the United States (“U.S.”) can be traced back to the Constitution’s provision of specific powers to the Congress to “promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.” With this power, Congress implemented a patent system (codified in Title 35 of the United States Code) that granted patents for any “new and useful process, machine, manufacture or composition of matter.” The Patent Act gave inventors, artists, and creators “the right to exclude others from making, using, offering for sale, or selling” their inventions and artistic works.

The main objective of the patent system is to safeguard the inventors’ rights in their inventions while facilitating economic and social growth by “transfer and dissemination of technology, to the mutual advantage
of producers and users of technological knowledge in a manner conducive to social and economic welfare.”

Usually, a two-fold argument is presented in favor of granting patents: (i) patents stimulate technological improvements, and (ii) patents facilitate the exploitation of new developments to their fullest potential.

The generally accepted theoretical explanation underlying patents is that the “patent system encourages the initial outlay of money or the sunk cost in developing an invention even in the face of uncertain outcomes” because the patent system guarantees protection and confers rights on the patentees to exclude others, for a specified period of time, from capitalizing on their investments and appropriating their profits without their consent. This protection is essential for encouraging innovation since initial investments or sunk costs could be extremely high. Without patent protection, innovators would be reluctant to invest in research and development (“R&D”) projects due to fears that their inventions would be immediately copied without compensation to the innovator.

By exercising the right of exclusion, patent holders can prevent competition with respect to the patented subject matter. The patent system gives limited monopolies to the patentees to exclude others from making, using, or selling their patented subject matter. This allows patentees to recoup their investment by commanding the price levels that would otherwise exist in a competitive market. Thus, patent law grants a limited term monopoly providing both incentives and rewards for innovation.

Granting a limited monopoly to the innovator, however, creates a negative effect known as deadweight loss. This deadweight loss adversely impacts consumer welfare. The patent system’s incentive function must balance against these negative effects. In practice, the patent system’s balancing function is not a perfect science. Therefore, even though the patent system is considered a “crude and imperfect instrument,” most economists view it as a necessary evil to improve quality of life, which, in the absence of patent protection, would suffer greatly from technological stagnation. Patents are therefore the “price that society pays to encourage inventors to invent and then share their inventions with the public.”

In order for patents to promote innovation without harming competition, patent systems impose several requirements on those who want to obtain a patent for an invention. These conditions ensure that the government awards a patent only when justified and that the rights provided by the patent correspond with the inventor’s contribution. Most patent systems use three standards to determine whether a patent should be granted: (i) novelty of the invention; (ii) inventive steps; and (iii) useful application. In addition to these three standards, there are two more requirements that must be met: eligibility and adequate disclosure. A patent is not granted if it encompasses subject matter that is disclosed in or obvious from the “prior art”; it may be rejected or declared invalid. A valid patent claim cannot encompass what is literally described in or obvious from the prior art. It also must not include subject matter beyond what the inventor has described and enabled in the patent disclosure.

II. EVOLUTION OF BUSINESS METHOD PATENTS IN THE UNITED STATES

Before we trace the evolution of BMPs in the U.S., it is important to appreciate that “business method” is a very broad term that has a variety of different interpretations. The term “business method patents” has never been explicitly defined in any country’s patent laws. Historically, business methods were considered to be not patentable because they fell under the general premise that abstract ideas or theories were not patentable subject matter. Contrary to popular belief, BMPs are not a new concept; the notion that business methods should be granted patent protection has been promoted since the time of the growth of the patent system itself. However, this concept has evolved immensely in the U.S. over the past century.

A. Business Method Exemption Doctrine

Initially, U.S. courts consistently believed that “no mere abstraction, no idea, however brilliant, can be the subject of a patent irrespective of the means designed to give it effect.” For example, in Hotel Security Checking Co. v. Lorraine Co., the Second Circuit held that a bookkeeping system designed to prevent embezzlement by waiters did not constitute patentable subject matter because it was a system of transacting business. Thus, even if a business process or operation yielded a new substance, only the resultant substance and not the process was deemed patentable subject matter under the exception. Based on this decision, the
“business method exception doctrine” developed in the U.S., under which business methods were not considered patentable subject matter. Another landmark case ratifying the business method exception was Lowe’s Drive-In Theatres, Inc. v. Park-In Theatres, Inc.,52 in which the court held “that a system of transacting business was patentable not on its own, but rather only in conjunction with the means of making the system practically useful.”53

Therefore, business methods that otherwise might have been patentable subject matter were not disclosed to the public54. In most cases, they did not enter the public domain since they were instead protected by keeping them in-house as trade secrets.56 The business method exception doctrine continued over the years.57


The breadth and scope of 35 U.S.C. § 10158 remained largely unchanged for decades after the Second Circuit’s decision in Hotel Security Checking Co. As the speed of technological developments accelerated, the issue of whether subject matter hitherto considered not patentable should be considered patentable came up in the context of new technological innovations.

In 1981, the U.S. Supreme Court referenced the legislative history of Section 101 when stating that patentable subject matter included “anything under the sun that is made by man” in Diamond v. Chakrabarty.59 Later in 1992, in Arrhythmia Research Tech., Inc. v. Corazonix Corp., the Federal Circuit further expanded the scope and breadth of patentable subject matter by holding that a medical monitoring device attached to an analysis unit was patentable subject matter.60 Even as the courts expanded the scope of patentable subject matter in areas beyond medicine and biotechnology during the 1980s, there was still no decision on whether business methods should be considered patentable subject matter.61


Although the Courts in the 1980s broadened the scope of patentable subject matter considerably, the resulting case law did not directly consider business methods as patentable subject matter. However, during the 1990s a series of decisions in U.S. Courts recognized business methods as patentable subject matter under 35 U.S.C. § 101.

1. Article of Manufacture: Alappat and its Successors

In the mid-1990s, three Federal Circuit cases related to computer software resulted in further expansion of patentable subject matter. In re Alappat paved the way for patenting the practical application of an otherwise abstract mathematical algorithm, provided that careful drafting of the patent application established the invention as something more than a mathematical formula.62 Then, in In re Lowry, the Federal Circuit held that a claim directed to computer-readable medium were not analogous to printed matter, were not obvious, and were not anticipated by prior art.63 As a consequence, it enhanced the acceptability of inventions that used claim preambles such as “a computer-readable medium containing a data structure for …” or “a computer readable data transmission medium containing a data structure…” as patentable subject matter. In 1995, the Federal Circuit in In re Beauregard held that software is patentable subject matter as an article of manufacture if a claim included a computer readable medium accompanied by instructions for causing a particular operation on a computer.64 In light of these decisions, software could be considered an article of manufacture under 35 U.S.C. §101 if it met the requirements identified in these cases.


Although the Federal Circuit in In re Beauregard held that software was patentable subject matter as an article of manufacture, it did not use the term “business method” in its discussion. Therefore, the ambiguity continued whether business methods would be consistently recognized as patentable subject matter. In 1998, in State Street Bank & Trust Co. v. Signature Finance Group, Inc.,65 the Federal Circuit resolved this issue and formally “abolished the business method exception.”66 In this case, the court held that a financial business method that transforms data to produce a “useful, concrete and tangible result” is eligible for patent protection.67 More importantly, the Federal Circuit abolished the business method exception as an unwarranted limitation to statutory subject matter.68 It also noted that the BMPs must be held to the same legal requirements for

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patentability as any other innovation. However, the status of BMPs was still not completely resolved because State Street referred to business methods claimed as statutory machines and not processes.


In 1999, in AT&T v. Excel Commc’ns, Inc., the Federal Circuit resolved the issues regarding processes by further clarifying its position. The court held that a business method is patentable subject matter as a process under 35 U.S.C. §101. The Court also held that a useful, concrete and tangible result for a practical manner of application is considered patentable subject matter, and no physical limitations are required for a determination of patentable subject matter under 35 U.S.C. §101. Collectively, the decisions of the Federal Circuit in State Street Bank & Trust Co. and AT&T removed the so-called business method exception. As a result of this expansion of patentable subject matter, business methods are now recognized by the USPTO as patentable subject matter.

These decisions resulted in a surge in the number of BMPs applied for and granted by the USPTO, which led to Congress’s enactment of the American Inventors Protection Act of 1999 (AIPA). The AIPA, which brought about far-reaching changes to U.S. patent law, was intended to harmonize the U.S. patent laws with major trading partners. Although these decisions’ broad language appears to have lifted the business method exception for all types of business ventures, a review of literature shows that there remains no precise definition of BMPs. Scholars interchangeably use the terms “business method patents,” “internet patents,” and “software patents.”

D. Break Once Again: eBay Inc. and In re Bilski

Two recent decisions of eBay Inc. v. MercExchange, L.L.C. and In re Bilski have once again changed the landscape of BMPs, impacting it in two major ways: (i) they have made it more difficult to obtain BMPs; and (ii) they have made BMP enforcement more difficult. In eBay Inc., the U.S. Supreme Court unanimously held that an injunction should not be automatically issued based on a finding of patent infringement. It also held that an injunction should not be denied simply on the basis that the plaintiff does not practice the patented invention.

The Court’s decision in In Re Bilski enunciated a four factor test to determine whether to issue a permanent injunction in a patent case. This test required the plaintiff to show:

1. that it has suffered an irreparable injury; 2. that remedies available at law are inadequate to compensate for that injury; 3. that considering the balance of hardships between the plaintiff and defendant, a remedy in equity is warranted; and 4. that the public interest would not be disserved by a permanent injunction.

This test’s application makes it more difficult for patent holders who do not market a product that uses the patent to obtain injunctions against potential infringers.

In 2008, in In re Bilski, the Federal Circuit, which gave birth to BMPs a decade prior, arguably cast a threatening shadow on BMPs’ future. While addressing which technologies should be eligible for patent protection, the Federal Circuit to some extent retreated from the State Street Bank & Trust Co. test of patentability (that the inventions need only have a “concrete, useful, and tangible result”). The court ruled that a process is patentable if “(i) it is tied to a particular machine or apparatus, or (ii) it transforms a particular article into a different state or thing.” The court expressed concern that a patent should not “pre-empt substantially all uses of a fundamental principle.” The U.S. Supreme Court granted certiorari to this issue, and its recent decision in Bilski v. Kappos exacerbated the uncertainty regarding the future of BMPs; the Court did not give any clear guidance regarding the eligibility of BMPs as a statutory patentable subject matter under Section 101.

The U.S. Courts’ decisions in these two cases, particularly in In re Bilski, have led to passionate debate among scholars and lawyers regarding the future of BMPs. Future developments will give better insight into the effect of the Bilski decision on BMPs; it is possible that patents’ classification as business methods may change as the USPTO changes its subject matter definitions, either in response to court rulings or to legislative amendments.
III. TRIPS AGREEMENT AND BUSINESS METHOD PATENTS

The TRIPS Agreement’s primary objective is to provide “effective and adequate protection of intellectual property rights” and thereby “contribute to the promotion of technological innovation and to the transfer and dissemination of technology.” The TRIPS Agreement accomplishes this objective by establishing minimum substantive standards for the availability, scope, and use of intellectual property rights (IPRs). Each WTO Member State is required to comply with these standards.

TRIPS Agreement Article 27.1 requires Member States to provide patent protection for “any invention… in all fields of technology,” provided they satisfy the requirements of being “new,” “involving an inventive step,” (non-obvious) and “are capable of industrial application” (useful) subject only to specifically enumerated exceptions. Even though the patentability of subject matter is defined very broadly, this expansive definition is subject to a few limitations. The first limitation, though not explicitly provided for in the TRIPS Agreement, is that natural principles, scientific phenomena, abstract ideas and mathematical formulas are not patentable.

In addition, the TRIPS Agreement explicitly provides for two kinds of exceptions in Articles 27.2 and 27.3. TRIPS Agreement Article 27.2 permits Member States to “exclude from patentability inventions, the prevention within their territory of the commercial exploitation of which is necessary to protect ordre public or morality . . . provided that such exclusion is not made merely because the exploitation is prohibited by their law.” TRIPS Agreement Article 27.3 further allows Member States to exclude “diagnostic, therapeutic and surgical methods for the treatment of humans or animals” and “plants and animals other than microorganisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes” from patent protection.

Even with this additional guidance from the TRIPS Agreement, it is difficult to determine whether business methods are patentable. Business methods do not likely fall in the category of specifically excluded subject matter under TRIPS Agreement Article 27. To analyze a business method’s patentability, Article 27.1 provisions, which outline conditions for the grant of a patent, should be examined to determine whether these provisions include or exclude business methods. Since the TRIPS Agreement does not specifically define the terms “new,” “inventive steps” and “capable of industrial application,” considerable ambiguity exists in attempting to define these terms in the context of the TRIPS Agreement. The lack of clear definition for these terms results in significant differences in these requirements’ application among the Member States. The confusion is further exacerbated by Article 27’s failure to explicitly accept or reject business methods as patentable processes. The TRIPS Agreement does not provide any guidance with regard to the patentability of business methods.

Proponents of the patentability of business methods argue that lack of specific exclusion under Article 27 suggests that the TRIPS Agreement includes protection for business methods. Contrarily, opponents argue that since most business methods entail computer programs and the TRIPS Agreement specifically grants copyright protection to computer programs, such alternative protection indicates that the TRIPS Agreement specifically excludes computer programs from patentability. In the absence of legal definitions for patentable subject matter criteria, the TRIPS Agreement leaves considerable room for Member States to interpret what constitutes patentable subject matter and whether business methods should fall under this interpretation. Since their obligations are not clearly determined under the TRIPS Agreement, Member States have adopted different standards for business methods’ patentability in manners that suits their national interest. Furthermore, it appears that confusion may grow among Member States unless the WTO established minimum international standards and minimum rights with respect to business methods.

IV. STATUS OF BUSINESS METHOD PATENTS OUTSIDE THE UNITED STATES

As discussed earlier, the TRIPS Agreement does not give clear guidance whether business methods should be given patent protection. Its silence on this issue has allowed Member States to treat the issue according to their national interests. While the U.S. grants patents to business methods as long as they have useful application, other countries are divided. For instance, Japan, Australia, Singapore and possibly Korea generally
appear to follow the U.S., whereas the European Union (“EU”), the United Kingdom (“UK”), Canada and India are more conservative on the issue and do not favor BMPs.\textsuperscript{110}

A. BMPs under the European Patent Convention

European patents issued by the European Patent Office (“EPO”) are binding in all countries of the EU.\textsuperscript{111} Each EU Member State also has its own patent laws and issues patents through its own patent office. Furthermore, each has the right to control the enforcement of its patent laws.\textsuperscript{112} These Member States’ attempts to harmonize its patent laws with the EU standards have made their national patent laws less relevant.\textsuperscript{113}

Unlike the U.S. system, the Convention on the Grant of European Patents (“EPC”)\textsuperscript{114} does not define patentable ‘inventions’ within statutory classes of patentable subject matter.\textsuperscript{115} Instead, the EPC lists subject matter and activities that are deemed not to be inventions and therefore are not patentable.\textsuperscript{116} EPC Article 52(2) states these exceptions and explicitly denies protection to inter alia mathematical methods, computer programs, and methods of doing business.\textsuperscript{117} However, EPC Article 52(3) limits the scope of Article 52(2) by stating that protection will not be offered to subject matter or activities listed in Article 52(2) when they are claimed “as such.”\textsuperscript{118} Therefore, even though a scientific theory or mathematical method may not be granted patent protection, the “technical application of a theory or discovery” may be considered a patentable invention.\textsuperscript{119}

EPC Article 52(1) provides that patent protection should be granted for “any inventions which are susceptible of industrial application, which are new and which involve an inventive step.”\textsuperscript{120} According to EPC Article 54(1), inventions are considered new if they do “not form part of the state of the art,”\textsuperscript{121} which is similar to the U.S. requirement of “novelty”. Furthermore, EPC Article 56 mandates that a patentable invention contain an inventive step,\textsuperscript{122} which is again similar to the U.S. requirement of “non-obviousness.” The EPC’s “industrial application” requirement differs significantly from the U.S. patent system’s “utility” requirement. The EPO construes this requirement quite narrowly\textsuperscript{123} because “industrial applications” are in fact limited by the requirement that patentable inventions produce a “technical effect.”\textsuperscript{124} This serves as a major limitation to the patentability of business methods. Thus, even though the European patent system is considered to be far more stringent because it still upholds most conventional systems and does not allow business methods to be patented \textit{per se}, patent applications that describe the “technical effect” of these methods in addition to claiming abstract business methods can obtain protection under the European Patent system.\textsuperscript{125} In fact, despite the popular belief that business methods are not patentable in the European patent system, nearly 30,000 European patents have been granted in recent years in similar categories, without categorizing them as BMPs.\textsuperscript{126}

B. BMPs under Japanese Patent Law

Patent law in Japan is governed by the Japan Patent Law of 1959.\textsuperscript{127} For an invention to be patentable in Japan: (i) it must fall within the prescribed statutory subject matter involving a technical idea utilizing a law of nature;\textsuperscript{26} (ii) it must be “industrially applicable”\textsuperscript{128} (as in Europe); (iii) it must be “novel”\textsuperscript{129} (as in the U.S. and Europe); and (iv) it must be and have an “inventive step”\textsuperscript{130} (as in the U.S. and Europe). Although the industrial application requirement is comparable to the U.S. requirement of utility, the Japanese standard limits patentability to products or methods that are described as “technological.”\textsuperscript{131} The scope of patent protection is further limited by the requirement that “inventions liable to contravene public order, morality or public health shall not be patented.”\textsuperscript{113} The above requirement, coupled with the need for industrial applicability, had rendered business methods non-patentable. In accordance with this policy, the Japanese Patent Office (“JPO”) had refused the granting of patents to business methods.\textsuperscript{134} However, as the rapid development and diffusion of information technology resulted in a significant increase in importance of business methods, the JPO revised its guidelines for examination of computer software related inventions, and suggested that a business method may be patentable when claimed as a part of an invention involving a computer program.\textsuperscript{135}

Currently, Japan treats inventions for business methods in a similar manner as the EPO, and the JPO identifies that “most business-related inventions can be considered as certain forms of software-related inventions.”\textsuperscript{136} Presently, the JPO allows “computer programs recorded on or in a medium” to be patented by recognizing that such software are “products.”\textsuperscript{137} To satisfy the requirement that an invention utilize a law of nature, the JPO has construed the use of computer hardware for data processing to be a use of a law of nature.\textsuperscript{138} Thus, a business method, or any other method, implemented by way of a computer program may be patented as long as the computer program satisfies the other requirements of patentability.\textsuperscript{139} The claim must describe how the computer program in the invention utilizes the computer hardware; it must also exhibit inventiveness and
novelty in light of the prior art. However, a computer program satisfying the statutory requirements for patentability may still be considered not patentable if it fails to demonstrate industrial application.

C. BMPs under Indian Patent Law

The Indian Patents Act, 1970 defined an “invention” as any new and useful article, process, method or manner of manufacture; machine, apparatus or other article; or substance produced by manufacture; including any new and useful improvement thereto, and there was no specific provision excluding the patentability of software per se or business methods from the interpretation of this definition. However, to fulfill the international obligation of compliance with the TRIPS Agreement, the Patents Act, 1970 was amended in 2002, and “invention” was redefined as “a new product or process involving an inventive step and capable of industrial application.” More importantly, a new Section 3(k) was added, providing that “a mathematical and business method or a computer program per se or algorithms” was not considered a patentable invention.

In December 2004, the Indian Government took further steps to extend broader protection to software invention by promulgating the Patents (Amendment) Ordinance, 2004 and amending Section 3(k) to exclude from patentability “a computer programme per se other than its technical application to industry or a combination with hardware.” Even though this amendment expanded software’s scope of patentability, the Patents (Amendment) Act, 2005 repealed the ordinance and restored the earlier position.

Subsequent to Section 3(k)’s introduction to the Patents Act in 2002, mathematical and business methods, computer programs per se and algorithms are not patentable in India. The wording of Section 3(k) clearly connotes the legislature’s intention; whereas mere computer programs should not be patentable, inventions implemented by software, which are more than mere computer programs, could be patented.

Unfortunately, the Indian Patent Office (“IPO”) has shied away from granting BMPs. Therefore, to encourage grant of BMPs, the IPO released a Draft Manual of Patent Practice and Procedure in 2005 providing guidelines on the types of claims allowed in respect of software-related inventions, which was later revised in 2008. Although the IPO generally relies on the practices followed by the EPO and the UK, the IPO tends to reject patent protection for software methods with a technical effect, largely for three reasons: (i) the term “technical effect” is not defined in the Indian Patents Act; (ii) the Draft Manual is not binding on the examiners, as it is only in draft form; and (iii) there are no Indian precedents in respect to software inventions.

It is interesting to inquire whether the difference in treatment of business method and software patents in various countries has made any difference to business method and internet innovation in these countries. Unfortunately, this particular aspect has not been studied yet, probably because it is still too early for much evidence. Thus, in the next section, we endeavor to review the limited empirical evidence on the general effects of patent system on innovation.

V. PATENT SYSTEMS AND THEIR IMPACT ON INNOVATION

Over the past three decades, the number of patents granted around the world has grown significantly. With the increase in the number of patented inventions, the key question of how these patent systems impact innovation has drawn both economic and legal experts’ interests. The economic rationale, as discussed earlier, does not provide an unequivocal answer to this question. On one hand, patents encourage innovation in several ways. First, patents give inventors greater incentives to invent by providing for limited period of protection against imitators, who might otherwise simply copy the innovation and make it difficult for the inventor to appropriate return. In exchange for that protection, patent systems require the inventor to make adequate disclosures about the patented innovation. This not only enhances the diffusion of knowledge by helping others to understand and improve or incorporate it in a new invention of their own but also tends to decrease redundant R&D investments by firms who might otherwise continue trying to develop the same technology. Patents also add to knowledge diffusion by facilitating exchanges via licensing agreements. On the other hand, patent systems have a discomforting downside. The limited monopoly rights granted by the patent may distort competition, which may result in inefficient allocation of resources and obstruction with follow-on innovation.
The relationship between patents and innovation is complex; the correlation between the availability of patents and incentive to innovate is not universal.\textsuperscript{161} The relationship is also industry specific and varies across industries.\textsuperscript{162} Therefore, it is essential to rely on theoretical as well as empirical evidence where a patent system has been introduced, eliminated, or changed in major ways. In this section, we examine theoretical and empirical evidence concerning the general relationship between patents and innovation, as well as evidence regarding the impact of changes in patent policy, to see what conclusions can be drawn about whether patents are encouraging innovation or deterring it.

A. Patent Systems and Innovation: Theoretical Evidence

The strongest theoretical justification in favor of granting patent rights to the inventor(s) comes from utilitarian incentive-based arguments for intellectual property: “it rewards the inventor for his skill and labor; it stimulates him, as well as others, to still further efforts in the same or different fields; it secures to the public an immediate knowledge of the character and scope of the invention. Each of these objects, with its consequences, is a public good, and tends directly to the advancement of the useful arts and sciences.”\textsuperscript{163} However, this argument is extenuated to a certain extent by three observations. First, inventors are not always motivated by financial factors; often they are motivated by other factors.\textsuperscript{164} Additionally, often the government supported R&D projects provide enough incentive to inventors to create equal or even greater amounts of intellectual property as compared to what is produced by granting limited property rights.\textsuperscript{165} Finally, patents are not the only instruments that facilitate the innovators to appropriate benefits commensurate with their investments. They often do so by bringing the products to the market quickly and secretly.\textsuperscript{166} Nevertheless, patents are powerful instruments to encourage innovators to innovate, especially in three circumstances: (i) when significant funding is needed to develop an invention;\textsuperscript{167} (ii) when it is difficult to keep the innovation secret; or (iii) when imitation is easy.\textsuperscript{168}

The patent systems, however, have detrimental effects as well. It is ill-suited for rewarding sequential or cumulative innovators where each innovation builds on the previous innovations.\textsuperscript{169} It is also difficult to design an appropriate incentive structure for such innovations due to a lack of sufficient information prior to writing the contract before the first innovation.\textsuperscript{170} The current patent systems also may instigate opportunistic behavior or disproportionate bargaining power of one of the parties involved.\textsuperscript{171} The need to pay high licensing fees to earlier innovators reduces the incentives to develop follow-on innovation in these industries.\textsuperscript{172} In addition, the problem of contracting for many small pieces of technology in industries with very complex technologies may be so severe due to high transactions costs that it may discourage innovation altogether.\textsuperscript{173}

There are several other detrimental effects of patent systems. As patents become easier to obtain and broader, more patents will be issued, and they will be more comprehensive (up to a saturation point). That, in turn, can lead to five types of costs:\textsuperscript{174} (i) increase in static inefficiencies;\textsuperscript{175} (ii) increase in dynamic inefficiencies;\textsuperscript{176} (iii) a larger number of broader patents encourages socially wasteful rent-seeking behavior; (iv) enforcement costs increase as there is more to enforce; and (v) it is possible that overbroad patent rights and easier patentability will lead to inefficient overinvestment in R&D. Easier patentability and greater patent breadth also raise the difficulty, cost, and risk of incremental innovation by making infringement a larger concern. This tends to reduce follow-on innovation for two reasons. First, the patentee is more likely to feel satisfied with the strength of its patent position and therefore may be less likely to invest in further innovation.\textsuperscript{177} Second, follow-on innovators are more likely to need a license to the original patent before they can reap any benefit from their work.\textsuperscript{178} This also entails huge transactions costs in identifying and paying for necessary licenses. In fact, a loose patent system could lead to a situation where so many necessary inputs are patented that the money and time required to identify and procure licenses discourages or even stops further innovation in a given field of research.\textsuperscript{179}

A difficulty for policymakers is that it is virtually impossible to quantify the net value of the innovation that will be gained or lost if they opt for a tighter or a looser patent policy. Nevertheless, a substantial amount of theoretical work has been done to aid policymakers who are interested in optimal patent standards.\textsuperscript{180} An overview of that is briefly presented below.

Many of the theoretical frameworks express optimal patent regimes as a trade-off between patent breadth and patent length. For instance, Gilbert and Shapiro\textsuperscript{181} define patent scope as the price that a given innovation will bring in the market. Using their model to calculate the maximum social surplus for all combinations of
patent breadth and duration that generate enough revenue to meet R&D costs, they conclude that the optimal patent length is infinite and that the optimal scope is just broad enough to cover the R&D investment.\textsuperscript{182}

Gallini\textsuperscript{183}, however, arrived at a sharply contrasting result when she re-characterized patent breadth as a determinant of the ease of entry into the inventions market. In her model, patent breadth is the cost that entrants are required to bear to imitate the invention without infringing it. She found that a narrower scope of patent resulted in a lower price because it was easier for competitors to invent around the patent. However, the implications for longer patent durations were mixed. Up to a certain length, increasing the patent’s duration enhanced the innovator’s profit, but when duration became long enough, it began to encourage competitors to invest in R&D with the aim of inventing around the patent. In such a situation, at least some of that R&D would be redundant and therefore wasteful.\textsuperscript{184} The objective of Gallini’s study was to find the combination of breadth and duration that minimizes the two types of social costs that patents carry: deadweight loss and redundant R&D. She demonstrated that the best design avoids redundant R&D altogether by making patents broad and short-lived.\textsuperscript{185} She argued that if patents were broad enough to discourage attempts to invent around them but so short-lived that they gave the inventor enough time only to recover its costs, then competitors would simply wait for the patent to expire before copying the invention. This also resulted in minimizing the deadweight loss.

Maurer and Scotchmer\textsuperscript{186} later pointed out that Gallini did not take into account the possibility of licensing.\textsuperscript{187} They argued that the problem of redundant R&D spending could easily and voluntarily be avoided by private licensing rather than by adjusting public patent policy.\textsuperscript{188}

The most important limitation of these theoretical models is that they assume innovations are discrete processes, which lead to one separate invention at a time.\textsuperscript{189} However, more often than not, innovations are cumulative in the sense that they build on previous inventions.\textsuperscript{190} Thus, rather than creating an entirely new and independent invention, R&D may be undertaken to improve an existing technology or find a new application for it.\textsuperscript{191} Incorporating this consideration adds a number of intricacies and complications to the problem of optimal patent design. Scotchmer identified the main challenge, which has to do with the fact that without the groundbreaking innovations on which they build, follow-on inventions cannot be made.\textsuperscript{192} Some of the profit generated by follow-on inventions is therefore attributable to the foundational work done by the groundbreaking innovator, and the original inventor should be given some of the subsequent profit to encourage him to invent in the first place.\textsuperscript{193} Otherwise, original innovators would be under-rewarded for the social surplus they enable.\textsuperscript{194}

The difficulty, however, is in determining how to allocate profits optimally between the groundbreaking innovator and those who build on it to adequately encourage all of them.\textsuperscript{195} Another associated problem with cumulative or sequential innovation is determining the standard for inventive steps to qualify for patent protection.\textsuperscript{196} While a lower threshold for the inventive step has the benefit of encouraging the disclosure of even small technological advances, it may persuade the innovators to opt of patent protection in exchange for secrecy.\textsuperscript{197} On the other hand, while a higher threshold of the inventive step would encourage innovators to endeavor for major breakthroughs, smaller advancements would not be disclosed.\textsuperscript{198} The scholars, however, agree that the optimal design of patent policy depends on how difficult it is for patent holders to use licensing to rearrange and exercise their rights.\textsuperscript{199}

It is clear that the theoretical evidence discussed above does not provide an unequivocal answer to the issue of how patent systems impact innovative activity. Therefore, it is essential to rely on empirical observations where a patent system has been introduced, eliminated, or changed in major ways.

**B. Patent Systems and Innovation: Existing Empirical Evidences**

There is no dearth of empirical studies that examine the relationship between patents and innovation, and complete review of the same is beyond the scope of this paper. To understand the relationship between patents and innovation, we will primarily focus on those studies in which scholars have empirically looked at the historical data with respect to patent systems that changed over a period of time and their consequences on subsequent innovative activity.

There has been an upsurge in patenting activity in the last three decades. One could presume that it was primarily due to an increase in innovation, but several studies challenge this presumption. For instance, an econometric analysis of patents issued by the EPO suggests that the nearly two-thirds increase in European patents between 1991 and 2000 was attributable to a decrease in the number of patent applications filed in the
EPO\textsuperscript{200} Moser\textsuperscript{201} and Lerner’s\textsuperscript{202} studies are also worth mentioning in this context. These studies used 19th-century data for their research. Moser found that inventors in countries without a patent system do not engage in innovative activity more than inventors in countries with patent systems.\textsuperscript{203} However, inventors in countries without patent systems do tend to engage in innovative activities in areas that are more easily protected with trade secrecy.\textsuperscript{204} Lerner found that when a country strengthened its patent system, inventors from other countries patented more in that country,\textsuperscript{205} but it didn’t have significant impact on the innovative activity of the inventors from the host country itself; they neither patented more in their own country nor in the foreign country with a well-functioning patent system.\textsuperscript{206}

Cohen, Nelson and Walsh,\textsuperscript{207} Levin, Klevorick, Nelson and Winter\textsuperscript{208} and Arundel\textsuperscript{209} used survey evidence to demonstrate that patents were not the most significant means to appropriate returns from their innovation. In fact, firms used secrecy,\textsuperscript{210} speed,\textsuperscript{211} and superior sales and service\textsuperscript{212} rather than patents to secure returns from their innovations. However, patents were the most important mechanism for protecting and appropriating returns from innovations in some sectors that required high R&D investments, such as the pharmaceutical and chemical industries.\textsuperscript{213}

In another study, Park and Ginarte,\textsuperscript{214} using aggregate data across 60 countries, found that the strength of the IP system\textsuperscript{215} was positively associated with R&D investment in the 30 countries with the highest median incomes, such as G-7 and other developed countries, mostly in Europe. However, for the remaining countries, the relationship was found positive in direction but not significant. Because this study was based on cross-sectional data, it suffered from the problem of simultaneity\textsuperscript{216} between doing R&D and having a patent system. This could be the reason for the stark difference between results of this study and those of Moser’s and Lerner’s studies.\textsuperscript{217}

The few studies that focus on particular industries have also questioned the link between expanded patent rights and innovation. For instance, Bessen and Hunt’s\textsuperscript{218} study challenges the assertion that including software in patentable subject matter incentivizes software innovation.\textsuperscript{179} Contrary to the conventional wisdom, the study concludes that the relationship between software patents and the intensity of R&D, and consequently innovative activity, is weak.\textsuperscript{220} In another study, Hall and Ziedonis\textsuperscript{221} examined the patenting behavior of approximately one hundred U.S. firms in the semiconductor sector, in which the patenting rate had doubled in the 1980s. The study revealed that the increase reflected efforts by companies to put large patent portfolios together for the purpose of preventing or delaying innovation-blocking strategies by competitors that owned other technology necessary for manufacturing semiconductor chips.\textsuperscript{222}

Several interesting conclusions can be drawn regarding the effect of the patent system on innovation from the survey of empirical work discussed above. Firstly, introducing or strengthening a patent system by lengthening the term of patent protection, broadening subject matter coverage, or other methods results in an increase in patenting activity and in the strategic uses of patents. Secondly, the relationship between patents and innovation is ambiguous; there is at best limited evidence to suggest that innovative activities increase directly from strengthening of the patent system. However, patents certainly positively affect some sectors such as the pharmaceutical industry because of huge R&D outlays and because the patents in these areas are relatively easy to define and enforceable in case of infringement. Thirdly, with regards to the role of patents within the process of technological innovation, economic analysis identifies the patent as an ancillary but necessary factor. Finally, the strength and scope of the patent system affects the organization of knowledge-based industries, such as software and semi-conductors, by allowing trade in knowledge and by facilitating their vertical disintegration.

We can draw some inferences from the above studies regarding implications of BMPs on innovation in business methods. Before we do this, we must recognize some limitations of these studies: (i) the findings of these empirical studies cannot be directly applied to BMPs because the patents in the studies discussed above have been associated with the product and processes, whose value can be quantified and measured;\textsuperscript{223} and (ii) the empirical data on BMPs is inadequate because of the brief period for which business methods have enjoyed patent protection.\textsuperscript{224} In light of the earlier studies disclosing that patents are not considered essential for capturing the returns from innovation in most industries, there seems to be no reason to presume that business methods are different.\textsuperscript{225}
VI. ISSUES CONCERNING BUSINESS METHOD PATENTS

BMPs are criticized for numerous issues. We will discuss this in three parts for easier comprehension and evaluation: (i) problems with the USPTO; (ii) issues relating to the quality of patents; and (iii) problems relating to unchecked proliferation.

A. Problems with the USPTO

Many scholars argue that the USPTO, the United States agency responsible for the examination and awarding of patents, is itself responsible for the problems relating to BMPs. The USPTO is currently facing several problems: (i) severe constraint of funds; (ii) under-staffing with a shortage of patent examiners having relevant technical training to deal with complex inventions; (iii) lack of resources to compensate for inadequate training and skill of patent examiners; (iv) increasingly large workloads; and (v) inappropriate organizational structure for examining and verifying the existence of prior art or otherwise. Because of these problems, coupled with a deluge of patent applications filed in the USPTO post-State Street Bank, the USPTO has been unable to keep up with its work.

In addition to the USPTO’s systemic problems, patent examiners also faced several other problems: (i) rapid and broad expansion of patentable subject matter; (ii) business methods combining software with abstract ideas, making them increasingly non-technical; (iii) BMPs becoming more scattered throughout the prior art, further challenging patent examiners’ already limited capacity in identifying the prior art while evaluating patent applications for the non-obvious requirement; (iv) thin prior art as many Internet and software patents are just beginning to emerge and few precedents have been set; (v) complexity of the examination process coupled with a large number of claims per patent; and (vi) patent examiners often being less informed than innovators about relevant prior art and thus at a severe disadvantage during examination. The end result of the USPTO’s lack of preparedness and the problems faced by the patent examiners has led to dilution of BMP applications’ evaluation against the non-obviousness requirement, which consequently has resulted in the granting of far too many low quality BMPs. This has resulted in a vicious cycle. The granting of a large number of invalid or poor-quality patents leads to an increase in patent application filings for which the patent examiners are often unable to locate relevant prior art and do not have the skill to evaluate non-obviousness.

B. Issues Relating to Quality of Patents

Many critics of the proliferation of BMPs in the wake of State Street Bank have raised concerns about their poor quality rather than their existence as the real issue. But how can quality of patent be a concern when the statutory requirements of patentable invention-novelty, non-obviousness, and industrial applicability—are well defined? Critics of BMPs have criticized them mostly on three issues: (i) novelty; (ii) non-obviousness; and (iii) scope.

BMPs are most frequently criticized for having an excessively broad scope. Patent attorneys intentionally draft patent claims as broadly as possible so as to cover not only the actual invention at hand but also all possible future variants. Furthermore, because of the risk of triple damages for willful infringement, in-house legal counsel of the firms advise them against routine reading of issued patents. Consequently, they ignore relevant prior art while designing the scope of their claims. Sometimes, the claims are so broadly written that it is virtually impossible to comprehend what is actually claimed. Therefore, reading the claims is an art in itself, involving half technology and half linguistics. The USPTO’s traditional rule requiring that each claim be written in one sentence—even if the sentence runs on for many lines and contains multiple ideas and phrases—exacerbates the problem further. The downside of these excessively broad BMPs is that if these are enforced fully, they may effectively control entire lines of business activity, leaving little scope for others to venture in the field for innovation without risk of infringement.

Another criticism of BMPs has been that patents have been granted to “patently obvious” business methods. Lunney argued that although the statutory requirements of a patentable invention are well defined, the non-obviousness test has been weakened since the creation of the Federal Circuit in 1982, which led to the proliferation of poor-quality patents. For instance, Amazon’s “1-click” patent is severely criticized as too obvious.

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BMPs are also criticized for lack of novelty; patent examiners increasingly grant patents for already well-known and widely used business practices and processes because of their lack of access to prior art and expertise in evaluating it. Both economic and legal experts suggest that there is no potential gain from incentivizing an inventor by granting a patent for an invention that is not truly “new,” and it consequently leads to deadweight loss from monopoly.

Although some scholars argue that the costs of having higher quality patents may exceed the benefits, recent experience suggests that there are several unintended consequences of low quality patents in the form of complicating property rights and feedback effects.

1. Effect of Patent Quality on Social Welfare

From a social welfare perspective, an important characteristic of a high-quality patent is that there be relatively little uncertainty over the breadth of its claims. This includes two issues concerning (i) the specific features of technical advancement claimed under the terms of the patent; and (ii) whether these claims are likely to be upheld in legal proceedings following the issue of the patent. Uncertainty about the validity of a patent has several potential costs: (i) it may lead to under-investment in the technology by the patent holder; (ii) it could result in reduction in investment by potential competitors; and (iii) it could result in expensive litigation after both the holder and potential competitors have made substantial investments.

2. Poor-quality Patents Adversely Affect Entrepreneurship

Poor patent quality “has unsavory consequences on entrepreneurship, ranging from holdup licensing to patent thickets.” Firms wanting to contract, or license intellectual property, must allocate resources to investigate the validity of an issued patent which is of questionable quality. The allocation of resources undermines the firms’ ability to feasibly contract and may sometimes eliminate this possibility entirely. In addition, issuance of a large number of poor quality patents makes it profitable for patent trolls or entrepreneurs to acquire patents with broad claims, hoping that enforcement leads to a large payoff. This in turn results in the spending of a significant amount of money in litigation, causing “reduced rates of innovation decreased patent-based transactions, and higher prices for goods and services.”

3. Poor-quality Patents Cause Uncertainty

Poor-quality patents may cause significant uncertainty among inventors and those who seek to commercialize inventions. It may also slow down the speed of innovation as well as deter investment in the commercialization of new technologies. Fear of expensive litigation may deter smaller firms from entering into those areas where incumbents hold a large number of patents. Such deterrence may be rational and even enhance welfare if the incumbents’ patents are known for certain to be valid. However, when a small entrant firm is aware of poor quality patents held by incumbents, it may avoid entry into a technological area if the cost of invalidating the patents is too high. In such circumstances, technological alternatives may not be commercialized, causing adverse impacts on consumer welfare.

4. Poor-quality Patents Result in Economic Downslide

Poor-quality patents can have serious negative economic effects, as outlined by a preliminary study by the Phoenix Center for Advanced Legal and Economic Public Policy Studies. There are several reasons why poor-quality patents have a detrimental effect on the economy. First, companies have a tendency to pass some of the costs onto consumers, which these firms pay as licensing fees for their inventions that infringe on a patent. Consumers are also forced to pay extra for free information when an inventor is granted a patent or monopoly on information that was already in the public domain. Furthermore, firms are forced to direct resources away from productive research because of a decrease in sales and revenues due to the higher prices they charge consumers. To stay competitive, firms, particularly technology firms, spend significant resources on acquiring and enforcing substandard patents and collecting royalties instead of directing their resources towards more productive fields of economic activity. Finally, vast amounts of firm resources are consumed in patent litigation on patents that should not have been granted.
5. Poor-quality Patents Slow Down Innovation

The lack of reasonably rapid procedures for determining issues relating to patent validity and guaranteeing higher-patent quality slows down the speed of innovation, especially in fields that are characterized by “cumulative invention.”\textsuperscript{280} However, if these previous technical advances are covered by patents of doubtful validity or excessive breadth, the inventors intending to pursue “cumulative invention” that relies on these patents may be discouraged from doing so due to high costs of licenses and royalties.\textsuperscript{281} The grant of a large number of poor-quality patents will ultimately result in a significant increase in the “fragmentation” of property rights covering complementary technologies,\textsuperscript{282} which will also slow down the speed of innovation because of a significant increase in the transaction costs for the inventors intending to access these technologies either through licenses or by paying royalties.\textsuperscript{283} Finally, the grant of a large number of poor-quality patents will cause significant ambiguity amongst inventors regarding the level of protection given to these related inventions. This will consequently make it costlier and more challenging for inventors who intend to build on these related inventions.\textsuperscript{284}

C. Problems Relating to Unchecked Proliferation

The consequences of unchecked proliferation of BMPs are not unique to this class of patents; they are applicable to other kinds of patents as well. The unchecked proliferation of poor-quality patents has several drawbacks: (i) reduced incentives for innovation; (ii) encouragement of rent-seeking behavior;\textsuperscript{285} (iii) unjustifiable and unfairly limited competition;\textsuperscript{286} (iv) misuse of patents to exclude others;\textsuperscript{287} and (v) dramatically increased costs and frequency of litigation.\textsuperscript{288} In fact, the U.S. Congress passed the Business Method Patent Act of 2000 to prevent the adverse consequences of the indiscriminate issuance of BMPs.

VII. POLICY SUGGESTIONS

Several scholars have examined and studied in detail the issues discussed above in the context of business method, internet, and software patents. They have suggested various policy recommendations to address these issues.\textsuperscript{289} In this section, we collect and organize the policy recommendations made by these scholars in an effort to find an agreement between them. Several points emerge from the scrutiny of their works.

(i) Scholars generally agree that the average quality of patents issued by the USPTO during the past twenty years has been generally low, particularly in the software, internet and business method areas. The reasons for this are:\textsuperscript{290} (a) an overburdened USPTO due to a significant increase in the filing of patent applications, which has resulted from the issuance of low-quality patents; (b) lack of expertise in the relevant areas; (c) lack of prior art databases; and (d) the weakening of the non-obviousness test. Therefore, in order to deal with the extreme complexity, widespread claims, and lack of prior art, the USPTO must do in-house restructuring to develop a new art classification specifically for the emerging fields such as software, internet, and business methods.\textsuperscript{291} In addition, experts with extensive knowledge in the related fields should be hired as consultants for examination strategy and classification.\textsuperscript{292}

(ii) Policy recommendations focus on rectifying the problems witnessed in software, Internet and business methods, particularly addressing the patentability criteria and non-obviousness requirement. This should be raised for all technologies, especially in software, Internet and business methods.\textsuperscript{293} There is general agreement that patents should be granted only for exceptional innovations, and therefore, rational standards for non-obviousness criteria should be developed without harming incentives for innovation.\textsuperscript{294}

(iii) There are significant variations in the policy recommendations suggested by scholars with respect to subject matter extensions to software, Internet and business methods. Whereas some scholars suggest that software, Internet and business method patents should be treated like other technologies, others recommend that subject matter be restricted to “the repeatable production or transformation of material objects.”\textsuperscript{295} Nevertheless, a number of scholars have recommended reinstatement of the business method exception.\textsuperscript{296}

(iv) Some scholars argue that protection of computer software and business methods under copyright law or trade secrets is not advisable as it compels reinvention.\textsuperscript{297} On the contrary, patents provide strong protection to such innovations, compelling competitors to obtain a license from the patentee.\textsuperscript{298} Hence, granting patents to business methods, and consequently their publication, would be more useful and economical since it would not
only encourage their reuse but also allow their trading. However, some scholars highlight the need for seamless interfaces and “interoperability” between computer technologies. Therefore, they recommend narrow construction of BMPs and limited rights to reverse engineering for seamless interfaces and interoperability.

(v) Several authors who have studied BMPs in the U.S. have suggested that a strengthened inter partes post-grant re-examination system modeled after the European opposition system would encourage competitors and other third parties to bring forth prior art, especially in new subject matter areas where the USPTO has inadequate prior art searching facilities. Two arguments are put forth in favor of such a system. It would lead to earlier and cheaper invalidity determinations, which rely primarily on infringement suits accompanied by countersuits for patent validity. Additionally, by housing validity determination within the patent office, useful feedback on the performance and accuracy of examination could be generated relatively quicker and communicated at somewhat lower costs than if generated by the courts.

(vi) Several scholars have gone a step further and have recommended the introduction of a pre-grant opposition system, wherein a competitor brings prior art before the examiner and argues their case, with certain limitations and stipulations, in order to limit the number of broad and unwarranted patents. Realizing that some competitors may misuse the system for strategic blocking, it is suggested that the time period for submission of pre-grant opposition application be kept short. After two prior art submissions, the third party should face a fee, which would be refunded if it is found that the prior art is related to a claim during the examination.

(vii) Contrary to the twenty-year protection term granted in accordance with the traditional patent system, some scholars suggest reducing the protection period of BMPs. They give three reasons for this: (i) software industry development cycles are shorter than those in other industries; (ii) most of the business method, Internet and software patents are short-lived and developed by attempting to tweak or improve upon the existing patents; and (iii) business method, Internet and software patents are developed in an arena of competition rather than in a laboratory. However, distinguishing business method, Internet or software related inventions from other inventions remains a problem.

(viii) Some legal experts recommend extreme policy intervention. Contrary to the present system where “the burden of establishing invalidity of a patent or any claim thereof shall rest on the party asserting such invalidity” and the defendant has to prove it “clearly and convincingly,” they suggest that the defendant’s burden of proof should be changed from “clearly and convincingly” to a “preponderance of evidence.” They believe this would encourage applicants to strengthen their application’s examination. However, in order for this to occur, a system of higher quality patent examination should be made available, but not required, for applicants who wish to make a “gold-plated patent.” In this system, normal application filing would still be available, but it would not afforded a high degree of respect as defined by a “preponderance of evidence” standard if it was ever brought to litigation. This would provide a truthful picture of the patent examination process in the courtroom and before a jury.

CONCLUSION

The theoretical explanation for the granting of patents is that justifying monopoly rights for a limited period stimulates innovation, which in turn increases competitiveness and economic welfare in general. However, the empirical evidence does not unambiguously demonstrate such a relationship between patents and innovation. On one hand, the patent system does incentivize innovations, such as pharmaceutical products, that require large R&D outlays and substantial efforts to develop as well as innovations that can easily be imitated by competitors once they are brought to the market. On the other hand, empirical evidence shows that, in areas where innovations are incremental and where “cumulative inventions” are required to make a useful product, it is less obvious that the benefits of the patent system outweigh its costs. Most BMPs fall into the second category rather than the first.

Research scholars and legal experts suggest policy recommendations for BMPs primarily from two different perspectives. Some believe that business methods per se should be excluded from patentability. Others advocate that the non-obviousness test has not been applied carefully enough in the case of BMPs and that the lack of prior art databases has led to the issuance of many invalid or poor-quality BMPs.
With respect to the first perspective, excluding BMPs per se from patentability, although desirable, does not appear to be feasible due to the difficulty in defining them. Furthermore, given the number of BMPs now outstanding and the fact that even those patent systems, like the EPO and India, which specifically provide for exclusion of BMPs, such patents do exist whenever the invention solves a particular technical problem. BMPs are here to stay, and the first perspective does not appear to be a feasible option. However, the recent In re Bilski decision in the U.S. seems to move in the direction of excluding those patents that have wide and vague claims.

Therefore, we have to work around with the second perspective. Among other recommendations, legal experts advocate the use of a stronger pre-grant and post-grant opposition system in order to encourage third parties to bring prior art to the attention of the USPTO. Some smaller changes could also be made within the existing patent system to prevent the granting of patents with excessively broad scopes. Firstly, the one sentence rule should be eliminated to facilitate clearer language. Enhancing the clarity of the patent applications would not only help examiners in understanding the application, but it also would leave less room for manipulation by patent lawyers. Secondly, the USPTO could require applicants to disclose the computer code used to implement the claimed business method, which would enable the patent examiners to analyze the code to see which particular functionalities merit patent protection. Thirdly, the prior art database used at the USPTO should include a condition that precludes existing real world business strategies from being patentable on the Internet. Fourthly, the term of patent protection should be reduced substantially for business methods to somewhere between 5 to 7 years.

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3 E.g., The first possible case where a type of business model patent was granted in the U.S. was in Paine, Webber, Jackson & Curtis, Inc. v. Merrill Lynch, Pierce, Fenner & Smith, Inc., 564 F. Supp 1358, 218 U.S.P.Q. 212 (D. Delaware 1983).


5 AT&T Corp. v. Excel Communications, Inc., 172 F.3d 1352 (Fed. Cir., 1999) [hereinafter AT&T].


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Sullivan, supra note 10, at 5; Raskind, supra note 11, at 67-68.

Sullivan, supra note 10, at 6.


See U.S. Constitution, art. I, § 8, cl. 8.


Dreyfuss, supra note 8, at 265.

Id.


See Justice Department, supra note 19, §1.0; Raskind, supra note 11, at 70–71.

Raskind, supra note 11, at 70-71.

Id. This practice is commonly referred to as “free riding.” See id.


Raskind, supra note 11, at 71.

See DRATLER, supra note 26, at § 6.02 [2].

See Sullivan, supra note 10, at 1-2.

Id.

Id.

Id.

Raskind, supra note 11, at 71-72.

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Raskind, supra note 11, at 70-72.


See id., at 495.


See Rai, supra note 38, at 47.

Greg S. Fine, To Issue or Not to Issue: Analysis of the Business Method Patent Controversy on The Internet 42 B.C. L. Rev. 1195, 1199 (2001) (explaining that “prior art” is the reference point or baseline by which the Patent Examiner judges the newness or novelty of a description in a submitted patent application.


Rai, supra note 38, at 54.


So far “business method patents” has not been defined expressly in the legislation of any country. In 2000, a U.S. Representative proposed the Business Method Patent Improvement Act (H.R. 5364), which provided a definition of “business methods” but the Bill could not be passed in 2000. In 2001, this Bill was reintroduced as H.R. 1332, but till date the U.S. Congress has neither adopted it nor rejected it. See Russell A. Korn, Is Legislation the Answer? An Analysis of the Proposed Legislation for Business Method Patents, 29 Fla. St. U. L. Rev. 1367 (2002).

See Taketa, supra note 22, at 943 (stating that “[g]enerally, the business method exception held that a method of doing business was an unpatentable subject matter.”)

See John M Conley, The International Law of Business Method Patents, 88 Eco. Rev. 15, 18 (2003) (giving instances of BMPs granted earlier: (i) first such patent was probably granted to Perkins in 1789 for a system of detecting counterfeit notes; (ii) Hawkes was granted a patent in 1867 titled “Improvement in Hotel-Registers” (Letters Patent No. 63,889); (iii) Graves was issued a patent for an improved form for the accident insurance policies (Letters Patent No. 853,852); (iv) Hollerith obtained method and apparatus patents titled “Improvements in the Art and System of Computing Statistics” in 1889 (Letters Patent No. 395,781)).

Hotel Sec. Checking Co. v. Lorraine Co., 160 F. 467, 469 (2nd Cir. 1908) (quoting Fowler v. City of New York, 121 F. 747 (2nd Cir. 1903)) (creating exception stating that “[a] system of transacting business disconnected from the means for carrying out the system is not, with in the most liberal interpretation of the term, an art.”)

Id.


174 F.2d 547 (1st Cir. 1949).

Id. at 552.

Mehta and Moskowitz, supra note 48, at 2.

Id.

“The trade secret’ means information, including a formula, pattern, compilation, program device, method, technique, or process, that: (i) derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use, and (ii) is the subject of efforts that are reasonable under the circumstances to maintain its secrecy.” Uniform Trade Secrets Act, Section 1(4) (National Conference of Commissioners on Uniform State Laws, 1985).

In re Schrader, 22 F.3d 290 (Fed. Cir. 1994). As recently as 1994, this doctrine was referred to as a method to invalidate a patent under 35 U.S.C. § 101. See id.

35 U.S.C. § 101 (1994) (stipulating “[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.”).

447 U.S. 303, 309 (1980) (holding that living organisms produced by genetic engineering can be considered patentable subject matter).

958 F.2d 1053, 1061 (Fed. Cir. 1992).

33 F.3d 1526, 1545 (Fed. Cir. 1994).

32 F.3d 1579, 1580 (Fed. Cir. 1994).

53 F.3d 1583, 1584 (Fed. Cir. 1995).

State Street Bank, supra note 4.

See Taketa, supra note 22, at 951.

State Street Bank, supra note 4.

Id.

Id.

See id.

See AT&T, supra note 5.

Allison & Tiller, supra note 6, at 992.


In re Bilski, 545 F.3d 943, 88 U.S.P.Q.2d 1385 (Fed. Cir. 2008).


See eBay Inc., supra note 78.

For details, see http://www.supremecourtus.gov/opinions/05pdf/05-130.pdf (last visited May 11, 2011).

For details see In re Bilski, 545 F.3d 943 (2008)


E.g., Marvin Petry, Bilski v. Kappos: A New Chapter in Tax Strategy Patentability, Oct. 28, 2010, http://www.lexisnexus.com/community/patentlaw/blogs/patentcommentary/archive/2010/10/28/bilski-v-kappos-a-new-chapter-in-tax-strategy-patentability.aspx (last visited Oct. 26, 2011) (explaining that “Bilski seems, once and for all, to have ended the tax practitioners’ concern with tax strategy patents because it conclusively rejects tax strategy patents which were of significant concern, those that involve pure method steps....”); Ellen P. Aprill, The Impact of Bilski on Tax Strategy Patents, TaxProfBlog, June 28, 2010, http://taxprof.typepad.com/taxprof_blog/2010/06/aprill-bilski-.html (last visited Oct. 26, 2011) (stating that Bilski v. Kappos “leaves us in a greater state of uncertainty than that which existed before it was decided .... But it gives us no guidance as to how these precedents should apply to business method patents generally. It asks the Federal Circuit to undertake this task instead, even though the Supreme Court has rejected every attempt by the Federal Circuit to do so. The inability or unwillingness of the Supreme Court to address these difficult issues underscores that, for those who believe that tax strategies should not be patentable, legislation is needed.”)
Aprill, supra note 93.

See TRIPS Agreement, supra note 19, Preamble.

See Id., art. 7.


See TRIPS Agreement, supra note 19, art 27.1 (provides that “… [s]ubject to paragraph 4 of Article 65, paragraph 8 of Article 70 and paragraph 3 of this Article, patents shall be available and patent rights enjoyable without discrimination as to the place of invention, the field of technology and whether products are imported or locally produced.”).

Id. (using phrases such as “any inventions,” “whether products or process,” and “in all fields of technology”).

See e.g., 35 U.S.C. § 101 (the United States Supreme Court has repeatedly and consistently stated that there are only three categories of subject matter for which one may not obtain patent protection: (1) laws of nature; (2) natural phenomena; and (3) abstract ideas); United States Patent and Trademark Office, Examination Guidelines for Computer-Related Inventions” (USTPO Guidelines), available at http://www.bitlaw.com/source/soft_pats/final.html (last visited Oct. 29, 2011); Convention on the Grant of European Patents, art. 54 (2), Oct. 5, 1973, 1065 U.N.T.S. 255 [hereinafter EPC] (providing “discoveries, scientific theories and mathematical methods” should not be considered as invention.)

TRIPS Agreement, supra note 19, arts. 27.2 and 27.3.

TRIPS Agreement, supra note 19, art. 27.2.

TRIPS Agreement, supra note 19, art. 27.3.


See TRIPS Agreement, supra note 19, art. 10.


Rai, supra note 38, at 78.

See infra Section IV.


See M. Van Empel, The Granting of European Patents 25 (1975) (explaining that a European patent is basically “a ‘bundle’ of national patent applications which are processed together” by the EPO and conferring patent rights in each of the Member States applied for by the patentee.)


See EPC, supra note 100.


See EPC, supra note 100, art. 52(2).

See id. (stipulating that the following shall not be considered as inventions within the meaning of Article 52(1): “(a) discoveries, scientific theories and mathematical methods; (b) aesthetic creations; (c) schemes, rules and methods for performing mental acts, playing games or doing business, and programs for computers; (d) presentations of information.”)

Id. art 52(3); see also ROGER E SCHECHTER & JOHN R THOMAS, INTELLECTUAL PROPERTY: THE LAW OF COPYRIGHTS, PATENT AND TRADEMARK 311 (2003).

SINGER & SINGER, supra note 115, at 112.

EPC, supra note 100, art. 52(1).

Id. art. 54(1).

Id. art. 56.

See Thomas, supra note 8, at 1178-85.

See SINGER & SINGER, supra note 115, at 111.


Id. at 180.


See id. art 2(1); see also The Japanese Patent Office, Implementing Guidelines for Examination of Industrially Applicable Inventions, § 1.1 (providing a list of inventions that are not considered to be statutory, which includes but is not limited to: (i) natural laws as such; (ii) mere discoveries, where an inventor does not create a technical idea; (ii) personal skill; (iv) aesthetic creations; and (v) mere presentation of information) [hereinafter Industrial Examination Guidelines].

See id. art. 29(1).

See id. art. 29(1).

See id. art. 29(2).

See Industrial Examination Guidelines, supra note 128, at § 2 (stating that the term “industrial” is “interpreted in a broad sense, including mining, agriculture, fishery, transportation, telecommunications, etc., as well as manufacturing.”)

See Japan Patent Law, supra note 127, art. 32.


Id.

*Id.* at 408.

*Id.* at 407-08.

*Id.*


*See id.*, § 2(j).

*See* The Patents (Amendment) Act, No. 38 of 2002; India Code (2002), § 2(j).

*See id.*, § 3(k).

*See* The Patents (Amendment) Ordinance, No. 7 of 2004; India Code (2004).

*See Id.*, § 3(k).


*Id.* § 3(k).

*See Ghosh,* *supra* note 125, at 182 (explaining BMPs may be granted in India if the invention satisfied the ‘technical effect’ criterion.)

*Id.*

*See, Draft Manual of Patent Practice and Procedure,* Patent Office, India – 2005, ¶ 4.11.6 (providing that in respect of a computer invention “[t]he method claim should clearly define the steps involved in carrying out the invention. It should have a technical effect. In other words, it should solve a technical problem…The claim orienting towards a ‘process/method’ should contain a hardware or machine limitation.”)

*See Ghosh,* *supra* note 125, at 182.


*See CIPR,* *supra* note 106, at 14.

*See, e.g.,* 35 U.S.C. § 112.


*Id.*


*Id.*


*Id.*

Hall, supra note 77, at 8.

See Moore, supra note 163, at 614.

Hall, supra note 77, at 8.

E.g. pharmaceuticals, complex modern information technology, etc.

Id.


See Green & Scotchmer, supra note 169; Riis & Shi, supra note 171.


Mark A. Lemley, Property, Intellectual Property, and Free Riding, 82 TEX. L. REV. 1031, 1058-59 (2005) (It may be noted that these arguments of Lemley were only with respect to patent breadth, but it also applies to loose patentability standards.)

The large number of patents and broader patent breadth results in monopolization. Associated deadweight losses are also more likely.

It becomes harder for others to invent without infringing someone else’s patent.

See Grindley & Teece, supra note 173.

See Green & Scotchmer, supra note 169.

See Scotchmer, supra note 170.


Id.


Id.

Id.


Id. at 542.

Id. at 546.
See Scotchmer, supra note 170, at 30.

Id.

Id.

Id.

Id.

Id.

Gallini & Scotchmer, supra note 180, at 66. For example, there may be a standard for how ‘innovative’ a follow-on invention should be. See id.

Id. at 67.

Id.

Id. at 69.


Josh Lerner, Patent policy shifts and innovation over 150 years, 92 AM. ECON. REV. 221(2002).

Moser, supra note 201.

Id.

Lerner, supra note 202.

Id.


Id.; Cohen et al., supra note 207; Levin et al., supra note 208.

Id.

Arundel, supra note 209.

Cohen et al., supra note 207;


Id. (They developed an index for measuring strength of IP system based on coverage, especially whether pharmaceuticals are covered; membership in international agreements; lack of compulsory licensing and working requirements; strength of enforcement; and duration of patent protection.)

Also know as reverse causality.
See Moser, supra note 201; Lerner, supra note 202.


Id. at 1.

Id. at 11.


Id.

Raskind, supra note 11, at 78.

Id.


See Becker, supra note 226, at 8.


See Becker, supra note 226, at 18.

See Becker, supra note 226, at 17.

See Ghosh, supra note 125, at 177.

See Thomas, supra note 8.

See Becker, supra note 226, at 10; Rochelle Cooper Dreyfuss, Examining State Street Bank: Developments in Business Method Patenting, 1 COMPUTER UND RECHT INTERNATIONAL 1 (2001).

See Becker, supra note 226, at 10.

Raskind, supra note 11, at 84.

See Becker, supra note 226, at 18.

Id.

Id. at 2.

See Becker, supra note 226, at 18.

Hall, supra note 77, at 17.

See Dreyfuss, supra note 232; John H. Barton, Reforming the patent system, 287 SCIENCE 1933 (2000).

Under the novelty standard, the invention must not be identically disclosed in the “prior art” (i.e., the entirety of publicly accessible knowledge existing before the inventor filed the patent application). See e.g., EPC, supra note 100, art. 54 (2).

It means that the invention must not have been obvious from the prior art to a person of ordinary skill in that particular field of technology at the time the inventor filed the patent application.

Member States considerably differ in their treatment of industrial applicability. In the U.S., lawmakers apply the concept of “utility”. Hence, an inventor can patent certain developments that do not lead to an industrial product in the U.S. This concept is broader than the industrial applicability required in Europe and other countries. See UNCTAD, Patents: Subject Matter and Patentability Requirements 360 (2004),
available at http://www.iprsonline.org/unctadictsd/docs/RB2.5_Patents_2.5.1_update.pdf (last visited Aug. 18, 2011).

244 See Merges, supra note 8, at 590; see also Hunter, supra note 6, at 8-9 (giving examples of Amazon.com, Priceline.com, or Walker Digital patents to support the argument of grant of patents having broad scope.)


246 Id.
247 Id.
248 Osenga, supra note 228.
249 Id. at 83.
250 Patel, supra note 245.
251 See Hunter, supra note 6, at 9.
253 See Gleick, supra note 9.
255 See Bagley, supra note 8, at 272.
256 See Hunter, supra note 6, at 9.
257 See Hall, supra note 77.
260 Id.
261 Id. at 118.
262 Id.
263 Id.
265 Becker, supra note 226.
266 Id. at 1.
267 Id.
268 Thomas & Schacht, supra note 264, at 7.
269 Hall, supra note 77, at 13.
270 Id.
Field characterized by “cumulative invention” are those areas in which one inventor’s efforts rely on previous technical advances or advances in complementary technologies.

Hall, supra note 77, at 13.

Id.

Becker, supra note 226, at 5.

Id.

Id.

Id.

Id.

272 Hall, supra note 77, at 13.
273 Id.
274 Becker, supra note 226, at 5.
275 Id.
276 Id.
277 Id.
278 Id.
279 Id.
280 Field characterized by “cumulative invention” are those areas in which one inventor’s efforts rely on previous technical advances or advances in complementary technologies.
281 Hall, supra note 77, at 13.
282 Id.
283 Id.
284 Id. at 13-14.
285 See Merges, supra note 8, at 595.
287 Meurer, supra note 8, at 322.
288 See Shapiro, supra note 286, at 394; Lerner, supra note 271, at 464.
289 Hall, supra note 77, at 26 (summarizing the recommendations of a number of legal and economic scholars with respect to business methods, internet, and software patents.)
290 E.g., Becker, supra note 226; Osenga, supra note 228; Thomas, supra note 8; Dreyfuss, supra note 8.
291 See Becker, supra note 226, at 14.
292 Id.
293 See generally, Reinier Bakels & P. Bernt Hugenholtz, The patentability of computer programs (Discussion of European-level legislation in the field of patents for software, Study commissioned by the European Parliament), (Amsterdam: IViR) 27-28 (2002); Barton , supra note 240; John H. Barton, Non-obviousness, 43 IDEA 475 (2003); Dreyfuss , supra note 232; Lunney, supra note 254; Meurer, supra note 8.
294 See Barton, supra note 293.
296 See Meurer, supra note 8 (explaining that “decline of the business method exception to patentability will increase the frequency of patent floods); see also Dreyfuss, supra note 232; Bakels & Hugenholtz, supra note 293.
297 E.g., Mark A. Lemley & David W. O’Brien, Encouraging software reuse, 49 STAN. L. REV. 255, 255 (1997); Deepak Somaya, Incentives, organizational choices and transactional challenges in software production 2

298 See Lemley & O’Brien, supra note 297, at 255;

299 See Id.; Somaya, supra note 297, at 2.


301 Id.


304 Hall, supra note 77, at 16.

305 Id.

306 E.g., Becker, supra note 226, at 17.

307 See Becker, supra note 226, at 17-18.

308 E.g., Bakels & Hugenholtz, supra note 293, at 39; Ghosh, supra note 125, at 182; Becker, supra note 226.

309 Bakels & Hugenholtz, supra note 293.

310 Id. at 40.

311 Hall, supra note 77.

312 Id.


314 Recommendation made by Lee Hollaar, IEEE-USA Intellectual Property Committee Member.


316 Becker, supra note 226, at 15-16.

317 Id. at 16.