Introduction

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This book consists of articles written by participants in the Patents & Entrepreneurship in Business & Information Technologies conference held at the George Washington University Law School on June 12 and 13, 2009. The conference focused on whether the patent system is helpful or harmful to entrepreneurs in the fields of business and information technologies. In recent years, the use of business methods and information technologies has grown exponentially in our society, and the application of patent rights in these fields has been the subject of much debate. Although patents have been historically viewed as an important legal mechanism for fostering entrepreneurial activity in well-developed fields such as mechanical, chemical, and pharmaceutical innovation, it has been more controversial whether this conventional wisdom applies in these emerging areas. Some argue that patent protection could inhibit advances in areas such as software and financial engineering, whereas others insist that protection is as critical in these areas as it was for the emerging technologies of the past. The interface between the patent system and these areas of entrepreneurship highlights critical questions, such as whether the difficulties in these fields reveal more general problems with the existing patent system and whether the patent system can be, or should be, modified so that it better accommodates the practical needs of entrepreneurs in these and other fields.

Although many areas of the law are in flux, and any area tightly intertwined with fast-moving fields of technology might be expected by at least some to evolve rapidly,

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the field of patentable subject matter has been especially volatile over the past few decades and is showing no signs of settling down quickly. Each season's hottest case seems to enjoy little more than the proverbial fifteen minutes of fame before it is overshadowed by the next. Practitioners and commentators who focus on this area of the law well recognize that the field of patentable subject matter is strewn with countless examples of the one final, hottest, newest High Court case that will settle these questions once and for all – until the next many such cases come along to leave the field just as muddy as before.

No book devoted to such a rapidly changing legal environment could accurately claim for long that it was fully up to date. Fortunately, such constant updating is not necessary for a book such as this one, which is devoted to a general audience, because the same core issues and key tensions in the field of patentable subject matter have tended to play out repeatedly over the years. Thus, the field can be well explored by using almost any reasonably broad collection of cases as a reference point. In contrast, the central cost of waiting to update each thought to address more recent cases, especially in depth, would yield undue delay with no substantive benefit to the reader, somewhat like waiting for Beckett's Godot. Instead, we carefully selected prominent authors who have prepared particularly insightful chapters at particular points in time over the past few years that provide analysis and insight that are for practical purposes timeless when applied to the presently foreseeable legal landscape in this area.

An initial question concerning the patentability of business methods and software inventions is whether the patent system should include categorical bars on such inventions and, if not, whether they should be treated differently at all from other inventions. The recent Supreme Court decision *Bilski* v. *Kappos* considered patentable subject matter in the realm of business method patents. The Court issued its opinion in the summer of 2010, holding that the claimed system to hedge energy prices using weather projections was an abstract idea, ineligible for patent protection. Consistent with the Court's rejection, Pamela Samuelson and Jason Schultz argue in Chapter 1, *"Clues" for Determining Whether Business and Service Innovations Are Unpatentable Abstract Ideas*, for the rejection of an overbroad interpretation of patentable subject matter such as that advocated by the petitioner in *Bilski*. They begin by arguing that the history and structure of the statute limit the appropriate construction of patentable processes to those that are technological. Then, they suggest that allowing patents on nontechnological methods is unnecessary and likely to be harmful to innovation in those industries. Finally, they contend that removing the long-standing technological limit on patentable processes would undermine the institutional competence of the U.S. Patent and Trademark Office (PTO) and the federal courts to protect innovation.

In contrast, in Chapter 2, *Still Aiming at the Wrong Target: A Case for Business Method and Software Patents from a Business Perspective*, Kristen Osenga argues that the current debate on patentability for business methods as a category is misplaced.

She begins by discussing the rise and recent fall of business method patents and surveys the scholarly literature discussing business method and software patents. She then argues that the patentability inquiry is tied to examination and that the focus should be on improving the PTO's examining techniques and ensuring that patent applications are being held to the appropriate level of scrutiny for written description, enablement, novelty, and nonobviousness. She suggests that if the negative effects on competition and innovation can be addressed through this more thorough examination, then business method and software patents are not categorically bad and should be permitted.

The question of patentability for these fields may require an entirely different framework. Kevin Emerson Collins in Chapter 3, *Semiotics 101: Taking the Printed Matter Doctrine Seriously*, suggests a reconsideration of the printed matter doctrine and argues that semiotics can serve as a framework within existing doctrine for determining the acceptability of patentability of computer programs. He suggests a new approach to patentable subject matter, different from the contemporary patentable subject matter framework, based on a revised version of the printed matter doctrine. Collins notes the conventional view that a printed diagram is not a patentable invention, and he argues that there is an aspect of the printed matter doctrine that is worth identifying and saving in the modern age. He then considers semiotics – the interpretation of signs – and notes that if an inventor has discovered a new way of understanding the world (interpretant), the inventor cannot claim a meaningful invention (sign-vehicle). Collins combines the two theories and uses insights from a semiotic reformulation of the printed matter doctrine to offer suggestions about how computer software should be considered under § 101.

Most academics and practitioners who have significant experience with questions about patentable subject matter recognize that the reasoning courts and commentators tend to demonstrate when thinking about patentable subject matter as a question facing one particular field of technology (such as computers and business methods) often will be the same basic reasoning that they would use when thinking about a different field of technology (such as biology or medicine), and vice versa. In Chapter 4, *Patent Eligibility as a Policy Lever to Regulate the Patenting of Personalized Medicine*, Christopher M. Holman elucidates many of the links in the bodies of case law devoted to these different areas of technology. He then explores several practical implications of these insights for the field of biomedicine in general and personalized medicine in particular. Holman concludes by exploring a set of implications of these developments in the law of patentable subject matter for the types of business models that are likely to evolve and thrive in this important area of technology, including some important interactions with the public patient population.

Assuming that some form of protection for software, business methods, and biomedical inventions remains available, as seems likely, the question that then emerges is what the appropriate standard of protection should be. In Chapter 5, *The Inducement Standard of Patentability*, Michael Abramowicz and John F. Duffy

propose a renewed focus on the "inducement standard" when determining whether an invention is sufficiently nonobvious to justify patentability. The inducement standard was first articulated in the seminal patent law case *Graham* v. *John Deere*. It states that the purpose of the nonobviousness test is to identify and protect only inventions whose creation is attributable to the patent system. The academic consensus following *Graham* holds the inducement standard to be a useful theoretical construct, but one without practical implications. Abramowicz and Duffy argue that in fact the inducement standard, properly understood, should guide the PTO and the courts in implementing the nonobviousness standard. The theoretical and practical framework they defend can help show why software and business method patents often should receive more skeptical treatment than, for example, pharmaceutical inventions.

The business and entrepreneurial communities are important stakeholders in the patent system, and relying on these communities for guidance may be an alternative standard to that employed by the current patent system. In Chapter 6, *Patenting the Curve Ball: Business Methods and Industry Norms*, Gerard N. Magliocca proposes that patent subject matter eligibility should be interpreted to exclude a process unless the applicant can show that a norm of permitting protection exists within the relevant business community. He suggests three benefits that an industry customs test would have over the current patent system. First, fewer business method patents would be issued under this modified standard. This would stem some of the problems with the poor notice and costly litigation associated with these patents. Second, the use of norms resolves the need to define a scope of patentability across business method categories, an approach that had created substantial confusion. Third, the current view of process patents empowers those who seek to defect from a community ethic. His analysis steers a different course in the debate regarding whether business methods should be patented and suggests that they should be patentable subject matter when the relevant community believes it to be appropriate. He also suggests that the PTO and the courts would do better by following the norm of the industry, rather than setting new standards with respect to business process patents.

Empirical studies highlight the complex relationship between innovation of business and financial methods and the current patent system. In Chapter 7, *Business and Financial Method Patents, Innovation, and Policy*, Bronwyn H. Hall explores the relationship between the patent system and innovation through an economist's perspective, surveying theoretical and empirical approaches as well as the impact on patent quality. Her examination of theoretical works reveal that whether patents are a socially useful way to encourage innovation turns on the characteristics of the innovation process and the complexity of the products patented. She identifies two main conclusions from her survey of empirical works. First, introducing or strengthening a patent system (e.g., lengthening the patent term or broadening subject matter coverage) usually results in an increase in patenting, but it is unclear that an increase in innovative activity will result at all times and in all places. Hence,

she offers support to those who argue that a unitary patent system is far from optimal for supporting innovation. Second, the patent system has a tendency to affect the organization of industry by allowing trade in knowledge and facilitating the vertical disintegration of knowledge-based industries and the entry of new firms that possess only intangible assets. Hall notes that this tendency is particularly apparent with respect to business method and internet patents. She draws a tentative conclusion that business and financial patents fall under a category of innovations where it is less obvious that the benefits of the patent system outweigh the costs.

Litigation of financial patents is crucial to delineating the boundaries of these patents. The definition of patent rights has implications for how these rights eventually affect innovation. In Chapter 8, *The Litigation of Financial Innovations*, Josh Lerner conducts an empirical study of litigation stemming from patents related to financial products and services. Lerner finds that the financial patents being litigated are disproportionately those issued to individuals; litigated patents appear to be more important than other financial patents (i.e., they have more claims and disproportionately cite and are cited by other patents); and larger entities are disproportionately targeted in litigation. He discusses how his findings are consistent with the economic theory that high-stakes disputes should lead more frequently to litigation. However, he notes that other factors also contribute to how financial patents are litigated. Overall, he concludes that there are certain patterns in financial patent litigation, but how these suits may affect innovation remains to be determined.

Another issue in the area of patent and entrepreneurship is the behavior of innovators and how patents may affect the behavior of these individuals and entities. In Chapter 9, *Patent Search and Cumulative Innovation*, Michael J. Meurer focuses his examination of the patent system on cumulative innovation, the process of one innovator building on the efforts of earlier innovators. Economists widely recognize that cumulative innovation poses a serious challenge to those who try to design an optimal patent system. When one innovation builds on another, the patent system can be used to divide profits between two distinct innovators. In the area of information and communications technologies, Meurer recognizes that this model does not work well. Instead, he proposes a modified model of cumulative innovation to account for factors that cause patents to differ from property.

The behaviors of patent holders examined through case studies of particular entities also underscore the complex relationship between patents and entrepreneurship. Although much attention has been directed to the problem of nonpracticing entities or patent trolls, practicing entities also engage in behavior that exploits the defects in the patent system. In Chapter 10, *The Vonage Trilogy: A Case Study in "Patent Bullying,"* Ted Sichelman presents an in-depth case study of infringement suits alongside empirical research that assesses the prevalence of large-firm versus small-firm suits. For the in-depth case study, Sichelman presents "patent bully" suits filed by large established companies that threaten or institute costly patent infringement actions of dubious merit against smaller companies to suppress competition or garner licensing

fees. In particular, he identifies suits initiated by incumbent telecommunications carriers (Sprint, Verizon, and AT&T) against Vonage, an early-stage company providing consumer telephone services over the internet. In considering the merits of each suit in turn and the defense raised by Vonage, he points out several weaknesses in Vonage's defense and recognizes that, as a startup, Vonage has limited budgets that may reduce attorney effectiveness. As a result, Sichelman concludes that the patent bullies were able to hinder Vonage's technologies from competing, despite the weak merits of their suits, through leveraging the current patent system. Sichelman further determines that empirical studies confirm this pattern of patent bullying. He concludes by examining potential solutions to this issue, such as compulsory licensing and one-way fee shifting.

Another example where the behavior of patent holders under the current system may affect entrepreneurship is with universities that hold software patents. In Chapter 11, *University Software Ownership and Litigation: A First Examination*, Arti K. Rai, John R. Allison, and Bhaven N. Sampat systematically examine the ownership and litigation of university software patents. Their empirical research reveals that the number of software patents that a university owns is highly dependent on a tendency to seek patents in other areas. Their data also suggest that universities with higher patent propensities in other fields also tend to patent more software. Because the authors recognize that software is likely to follow a different commercialization path than invention in other fields, they argue that patenting and exclusive licensing of software may yield a higher proportion of situations where the exclusive licensee uses a patent to hold up an entity that has successfully commercialized without the need for an exclusive license. In conclusion, they indicate that university software patents have largely been used to extract rents in holdup litigation, rather than to foster commercialization.

Although broader scale patent reform has been often raised as a solution to resolve the uncertainties in protecting business and information technology, the problems with the current system may not be sufficiently severe to justify extreme changes. In Chapter 12, *The Individual Inventor Motif in the Age of the Patent Troll*, Christopher A. Cotropia starts with the individual inventor motif and explores whether there has been an attitude change in light of the existence of "patent trolls" in recent years. Cotropia lays out the premises that the individual inventor has been revered as an American icon and that the patent system seeks to assist and protect the individual inventor. Although Cotropia recognizes that there is no statutory basis for this premise, there is historical, legislative, judicial, and administrative evidence to support the motif. He offers as support congressional statements and testimony in discussions of the recent proposed patent reform legislation, the PTO's response to recently proposed sets of patent rules, and recent Supreme Court patent decisions. Cotropia then turns to the concern of patent holdup in the current system and describes the impact that patent trolls have on the individual inventor motif. He concludes that the motif has essentially remained unchanged; however, there is a

disconnect between the rhetoric of the individual inventor motif and the substantive impact of legal changes on the same inventors.

Finally, in Chapter 13, *Anything Under the Sun Made by Humans: Patent Law Doctrines as Endogenous Institutions for Commercializing Innovation*, James E. Daily and F. Scott Kieff take a New Institutional Social Sciences approach in arguing that a broad, easily satisfied patentable subject matter requirement is socially beneficial. For Daily and Kieff, narrower, more subjective notions of patentable subject matter place greater discretion in the hands of administrative agencies and the courts, both of which are subject to political influence, whether directly – as part of a political branch of government – or indirectly, such as through the filing of briefs by the Solicitor General's Office. They conclude that the end result is likely to be weaker patents, less certainty, and less innovation.

The ongoing controversy surrounding the modern patent system and its relationship with entrepreneurship in business and information technology is multifaceted. The chapters in this volume provide diverse perspectives on the various debates surrounding patents in business and information technologies.

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"Clues" for Determining Whether Business and Service Innovations Are Unpatentable Abstract Ideas

*Pamela Samuelson and Jason Schultz**

I. INTRODUCTION

In June 2010, the U.S. Supreme Court ruled in *Bilski* v. *Kappos* that Bernard Bilski's method for hedging risks of price fluctuations for commodities was an abstract idea that was ineligible for patent protection.[1] Four of the Justices would have gone further to hold that business methods were unpatentable subject matter; that is, not the kind of "process" for which patent protection was available.[2] Although the Court as a whole was not persuaded that business methods should be deemed categorically ineligible for patent protection,[3] in part because the term "business method" is difficult to define with precision,[4] Justice Kennedy, writing the opinion of the Court for himself and three other Justices, recognized that "some business method patents raise special problems in terms of vagueness and suspect validity."[5] After *Bilski*, these methods are likely to be deemed too abstract to be patentable.

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[1] Bilski v. Kappos, 130 S. Ct. 3218, 3231 (2010).

[2] *Id*. at 3231–32 (Stevens, J., concurring) (Justice Stevens was joined by Justices Ginsburg, Breyer, and Sotomayor).

[3] *Id*. at 3228 (majority opinion).

[4] *Id*. (indicating that it was unclear "how far a prohibition on business method patents would reach, and whether it would exclude technologies for conducting a business more efficiently").

[5] *Id*. at 3229. Justice Scalia did not join the subpart of Justice Kennedy's opinion in which this sentence appears. *Id*. at 3223.

Justice Kennedy went on to say that it was important to set a high bar for patentability of these kinds of inventions, because otherwise "patent examiners and courts could be flooded with claims that would put a chill on creative endeavor and dynamic change."[6] To avoid this chilling effect on business innovation, a limiting principle was needed so that the U.S. Patent and Trademark Office (PTO) and the courts could determine which kinds of methods affecting business operations should be eligible (or not) for patent protection. Justice Kennedy pointed to the Court's prior rulings on the unpatentability of abstract ideas as likely to provide useful guidance for achieving this purpose.[7] Drawing on these precedents, the Court of Appeals for the Federal Circuit might, he thought, be able to "defin[e] a narrower category or class of patent applications that claim to instruct how business should be conducted, and then rule that the category is unpatentable because, for instance, it represents an attempt to patent abstract ideas," adding that "this conclusion might well be in accord with controlling precedent."[8]

Although Justice Kennedy's opinion does not spell out with precision how to distinguish between unpatentable abstract ideas and patentable processes, it does offer some "clues" for drawing such distinctions that deserve attention going forward.[9] Part II of this chapter discusses the clues we think are most likely to be useful to the PTO and the courts in developing a jurisprudence about abstractness as a disqualification from patent protection. Part III explains why, in light of these clues and in line with sound patent policy, business and service method innovations, although not categorically unpatentable, should still generally be excluded from patent protection as abstract ideas. Part IV provides further support for this approach by suggesting that taking the clues of unpatentability seriously may facilitate administrative and judicial efficiency in reviewing patent claims when assessing whether they satisfy patent subject matter rules.

II. *BILSKI* DIRECTS US TO SEARCH FOR "CLUES" ABOUT ABSTRACTNESS

In this part, we mine the *Bilski* decision, the precedents on which it relies, as well as the Constitution, the Patent Act, and patent-related policies for clues that may aid in determining whether a claim is too abstract to qualify for patent protection or is instead sufficiently concrete to be eligible for patenting, assuming other criteria for patentability are satisfied. Although the rather amorphous clue-based approach to

[6] *Id.* at 3229. Justice Stevens' concurring opinion also emphasized that business method patenting could have chilling effects on innovation in that field. *Id.* at 3254–55 (Stevens, J., concurring).

[7] *Id.* at 3229 (majority opinion).

[8] *Id.*

[9] The Court in *Bilski* drew the "clue" metaphor from the Court's decision in Gottschalk v. Benson, 409 U.S. 63, 70 (1972) and endorsed its use for assessing patentable subject matter in the future. *Bilski*, 130 S. Ct. at 3226–27.

patent subject matter determinations may be frustrating for those looking for concise bright-line rules to patentability, it can be useful, especially when properly framed.

A. *Clues Derived from* Bilski *and Other Supreme Court Precedents*

Much like Sherlock Holmes or Harry Bosch, a patent examiner or a court searching for "clues" to patentability must both collect the clues and sift through them for a discernible pattern that leads to a sound conclusion. Often, it is easiest to begin with the most obvious clues and then move to those more nuanced or subtle. One clue readily discernible from the Court's *Bilski* decision is that the term "abstract idea" as a disqualification from patent protection is not limited to very high-level abstractions (e.g., the idea of cutting bread with a knife). For example, Bilski's first claim contained some relatively "concrete" elements, such as a commodity provider, a commodity, a price, and a market participant.[10] And yet, the Court was unanimous in regarding it as too abstract to qualify for a patent.[11]

A second clue comes from the Court's unanimous reaffirmation in *Bilski* that its decades-earlier ruling in *Gottschalk* v. *Benson* is still good law.[12] Benson had once hoped to obtain a patent on a multistep method of transforming binary coded decimals (BCDs) to pure binary form.[13] Under the patent subject matter standards used by the Federal Circuit for more than a decade prior to its ruling in *In re Bilski*,[14] Benson would have been eligible for a patent because his method was capable of yielding "a useful, concrete, and tangible result."[15] Yet, the Supreme Court in *Bilski* could not have been clearer in expressing its view that the Benson method was too abstract to qualify for patent protection. The Court reiterated in *Bilski*, as it had in *Benson*, that no one can patent an idea.[16] The practical effect of a patent on Benson's method would, however, have been the grant of a patent on an idea that would "wholly pre-empt [use of] the mathematical formula" or algorithm at issue.[17]

[10] *Id*. at 3223–24 (quoting claim 1 of the Bilski patent).

[11] *Id*. at 3230–31. See also Interim Guidance for Determining Subject Matter Eligibility for Process Claims in View of *Bilski v. Kappos*, 75 Fed. Reg. 43922, 43924 (U.S. Pat. & Trademark Office July 27, 2010) [hereinafter Interim Guidance] ("Moreover, the fact that the steps of a claim might occur in the 'real world' does not necessarily save it from a section 101 rejection. Thus, the *Bilski* claims were said to be drawn to an 'abstract idea' despite the fact that they included steps drawn to initiating transactions. The 'abstractness' is in the sense that there are no limitations as to the mechanism for entering into the transactions.").

[12] Gottschalk v. Benson, 409 U.S. 63 (1972), *cited with approval in Bilski*, 130 S. Ct. at 3230, *and id*. at 3253 (Stevens, J., concurring).

[13] *Benson*, 409 U.S. at 65.

[14] *In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008) (en banc). In *In re Bilski*, the Federal Circuit abjured the useful, concrete, and tangible result test in favor of the "machine-or-transformation" test. *Id*. at 959–60. *See also infra* notes 33–38 and accompanying text.

[15] *See, e.g.*, State St. Bank & Trust Co. v. Signature Fin. Grp., Inc., 149 F.3d 1368, 1373 (Fed. Cir. 1998) (quoting *In re* Alappat, 33 F.3d 1526, 1544 (Fed. Cir. 1994)).

[16] *Bilski*, 130 S. Ct. at 3230 (quoting *Benson*, 409 U.S. at 67).

[17] *Benson*, 409 U.S. at 72, *quoted in Bilski*, 130 S. Ct. at 3230.