THE SUPREME COURT AND § 101 JURISPRUDENCE: RECONCILING SUBJECT-MATTER PATENTABILITY STANDARDS AND THE ABSTRACT IDEA EXCEPTION

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Can abstract ideas be patented? Not surprisingly, the act of defining a patentable abstract idea is inherently abstract. Subject-matter patentability is addressed in 35 U.S.C. § 101, which lays out four types of inventions eligible for patent protection. Although the statute has been construed broadly, it has been subject to three judicially created exceptions, and one of them is abstract ideas. While § 101 is well suited to adapt to changes due to new and unforeseen technologies introduced into our society, a coherent rule to govern patentability of abstract ideas has been lacking. After thirty years’ confusion over § 101 subject-matter patentability in federal courts, the U.S. Supreme Court recently took the opportunity to address this problem in two very important cases. Unfortunately, the Supreme Court has taken a passive position, without elaborating on a definitive substantive framework to aid lower courts in the § 101 abstract idea analysis. As a result, the subsequent Federal Circuit opinions have often been unclear and contradictory. This Note addresses the many unresolved issues surrounding the abstract idea analysis as evinced by Supreme Court and Federal Circuit jurisprudence in the past three years. In addition to outlining each opinion’s reasoning and summarizing key themes, this Note offers a pragmatic solution that could add more certainty to § 101 jurisprudence. The suggested approach would enable § 101 to filter out undesirable inventions without overburdening courts by forcing them to grapple with the amorphous bounds of abstract ideas.

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I. INTRODUCTION

The Supreme Court has taken a recent interest in intellectual property (IP) cases.¹ Even as the Court’s docket has shrunk in recent years, the number of IP cases it hears is on the rise.² In 2012 alone, intellectual property cases accounted for eight percent of the Supreme Court’s caseload.³ To put that in perspective, the number has increased fourfold in just twenty years.⁴ Some suggest this new trend is partly motivated by Justices’ awareness of the new, increasingly technologically driven U.S. economy.⁵ Although this may be one factor, one thing is clear, the Supreme Court believes intellectual property is a systematically important issue.⁶ Thus, it is not surprising that during the Court’s increased interest in IP, two very important and controversial patent cases have been decided that address subject-matter patentability and the fundamental scope of patent law in society.⁷

In *Bilski v. Kappos*, the Supreme Court considered 35 U.S.C. § 101’s subject-matter patentability provision for the first time in almost thirty

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². *Id.*
³. *Id.*
⁴. *Id.*
⁵. *Id.*
⁶. *See id.*
years. The Court considered whether the particular patent at issue was an abstract idea. Section 101 has historically been interpreted broadly to allow a person to patent almost any invention. However, there are three judicially created exceptions to the broad rule—abstract ideas are one such exception. The court ruled the patent was in fact abstract. Unfortunately, the opinion is somewhat unclear and describes a test for abstract ideas somewhat abstractly. The majority opinion states the patent is an abstract idea but never fully elaborates a framework that explains what exactly makes it abstract. A concurring opinion pointed out that the Court “never provides a satisfying account of what constitutes an unpatentable abstract idea,” contending that the “Court’s musings on this issue stand for very little.” Although the judges agreed on the outcome, any semblance of a coherent test for abstract ideas was lacking.

The Supreme Court seemed to take notice of the confusion following its Bilski opinion and two years later took a subject-matter patentability case in Mayo Collaborative Servs. v. Prometheus Labs., Inc. This time, the Supreme Court issued a unanimous opinion but again offered little in way of guidance for lower courts and practitioners. The Court considered whether the patent at issue was an exception to § 101. It acknowledged that an abstract idea alone cannot be patented, but if other inventive steps applied the idea in a practical way, then it was in fact patentable. For example, a mathematical equation on its own is an abstract idea, but if it is included as only one part of an inventive process, the process as a whole could be patented.

Unfortunately, the Court never says how many extra inventive steps are enough to make a process encompassing an abstract idea patentable. Practitioners have been quick to criticize Mayo because it creates a threshold for patentability but never defines its bounds. Some argue that by not defining substantive guidelines for what is enough, Mayo effectively creates a framework for patent eligibility where almost any method can be invalidated.

Thus, although the Supreme Court has heard two § 101 cases in two years, it has failed to elaborate any definitive substantive framework and

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13. Id. at 3231 (stating that hedging risk has been a long prevalent practice in our economic system, and thus concluding it is abstract).
14. Id. at 3236 (Stevens, J., concurring).
16. Id.
17. Id. at 1297.
18. Id.
19. Id.
21. Id.
instead encouraged the Federal Circuit to develop its own criteria. \(^{22}\) The Federal Circuit has been grappling with this challenge and the changing landscape of § 101 jurisprudence. \(^{23}\) After *Bilski*, the Federal Circuit decided five cases that directly or indirectly considered subject-matter patentability, one of which has already been vacated and remanded by the Supreme Court. \(^{24}\) In each case, the Federal Circuit tried enunciating a substantive test to address § 101 but fell short and seemed to take a passive role. \(^{25}\) Even after *Mayo*, the Federal Circuit continues to disagree over the status of any substantive § 101 test. \(^{26}\)

Judge Plager has aptly compared the widespread confusion and diversity in § 101 abstract idea analysis with oenologists trying to describe wine. \(^{27}\) He says, “[There is] an abundance of adjectives—earthy, fruity, grassy, nutty, tart, woody, just to name a few—but picking . . . in a given circumstance which ones apply . . . depends . . . on the taste of the tongue pronouncing them.” \(^{28}\)

This Note addresses the many unresolved issues related to the judicially created exceptions to § 101 subject-matter patentability with a particular focus on problems surrounding abstract ideas. It does so by analyzing Federal Circuit opinions in light of recent Supreme Court cases. Part II reviews the growth and development of exceptions to § 101’s generally broad patentability requirements. Part III.A will look to the case law post-*Bilski* and pre-*Mayo* to track changes in Federal Circuit jurisprudence following *Bilski*. Part III.B will look to case law post-*Mayo* and track changes in Federal Circuit jurisprudence up to the present day. Part III.C graphically summarizes Federal Circuit case law in light of *Bilski* and *Mayo* and attempts to pinpoint a coherent substantive framework for discerning abstract ideas. Finally, Part IV will propose pragmatic solutions to the judicial disagreements and vagueness surrounding § 101.

\(^{22}\) *Bilski* v. Kappos, 130 S. Ct. 3218, 3231 (2010).

\(^{23}\) See, e.g., *Bilski*, 130 S. Ct. at 3226 (taking the opportunity to explicitly reject the Federal Circuit’s machine-or-transformation test as the sole test for § 101).


\(^{27}\) MySpace, Inc. v. GraphOn Corp., 672 F.3d 1250, 1259 (Fed. Cir. 2012).

\(^{28}\) *Id.*
II. BACKGROUND

A. § 101 Subject Matter Eligibility and Judicially Created Exceptions

The ability to patent an invention is outlined in the U.S. Constitution. It states, “The Congress shall have power . . . To promote the Progress of Science and useful Arts, by securing for limited Times to . . . Inventors the exclusive Right to their respective . . . Discoveries.” Congress enacted the first U.S. patent statute immediately following the adoption of the Constitution in 1790, awarding the very first patent to Samuel Hopkins for a process for making potash from wood ashes. The patent system was designed to award inventors exclusive rights to make and sell a certain invention for a limited period of time as incentive for innovation. Congress acted with the hope that “[t]he productive effort thereby fostered will have a positive effect on society through introduction of new products . . . into the economy, and the emanations by way of increased employment and better lives for our citizens.” Thus, the negative effects of granting one person a monopoly for making or selling an invention is counterbalanced by the benefit society gains by incentivizing the creation of new products. It is a bargain between the inventor and society.

One very important consideration in U.S. patent law is patentable subject-matter, which addresses what types of inventions are eligible for patent protection. The statutory provision for this can be found in 35 U.S.C. § 101. It reads: “Whoever 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.” Essentially, Congress has laid out four types of subject-matter that can be patented, and allows patents on improvements to such items. The law further provides definitions for some important terms. For instance, “[t]he term ‘invention’ means invention or discovery,” and “the term ‘process’ means process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.”

On its face, the statute seems straightforward: if an invention fits one of the given categories, it is patentable subject-matter. But the Supreme Court in its 200 years of case law has shown the approach is not so

30. Id.
34. MERGES & DUFFY, supra note 31, at 67.
36. Id.
37. Id. § 100.
clear.\textsuperscript{38} Even though a patent’s subject-matter eligibility is based in statutory law, over the years it has gained a distinctly common-law feel.\textsuperscript{39}

Courts have generally interpreted § 101 as a broad statute that allows most inventions to be patent eligible.\textsuperscript{40} Since Congress chose to use broad language such as “manufacture” and “composition of matter” modified by the expansive term “any,” courts generally give the patent laws wide scope and read them broadly.\textsuperscript{41} This interpretation is supported by the legislative history.\textsuperscript{42} Thomas Jefferson, who played a major role in drafting the original patent law, believed innovation should receive liberal encouragement.\textsuperscript{43} When Congress contemplated the 1952 revision of the patent law, it explicitly stated that statutory subject matter should “include anything under the sun that is made by man.”\textsuperscript{44} For most inventions then, § 101 is a rather low hurdle to cross.

Three judicially created exceptions fall outside the typically broad scope of § 101 and are held to be unpatentable: laws of nature, physical phenomena, and abstract ideas.\textsuperscript{45} These items are “manifestations of . . . nature, free to all men and reserved exclusively to none.”\textsuperscript{46} Allowing such inventions would undercut the policy of patent law by giving someone a monopoly over an invention that would foreclose its use in any field, thereby inhibiting innovation. For example, Einstein could not have patented his equation $e=mc^2$ because it is a law of nature and falls into a § 101 exception.\textsuperscript{47} Although a useful equation, granting a patent on it, and thus a monopoly, would stifle innovation because no one could use that equation to further scientific research during the patent term. Accordingly, the fundamental policy of patent law (the bargain of giving a monopoly to an inventor in return for increased innovation) would not be present if courts allowed these exceptions to be patented. Patenting laws of nature, physical phenomena, or abstract ideas effectively forecloses an entire field of study because no one other than the inventor can use a particular equation or natural law. The inventor reaps the reward while society gets no benefit.

There are a handful of cases shaping the body of these exceptions so that judges and practitioners have a framework to decide whether an invention is patentable. For instance, in Funk Brothers Seed Co. v. Kalo Inoculant Co., the Supreme Court considered the bounds of the physical phenomena and natural laws exceptions.\textsuperscript{48} The patent at issue was a mixture of three bacteria which, when mixed and proportioned according to

\begin{itemize}
\item \textsuperscript{38} Merges & Duffy, supra note 31, at 68.
\item \textsuperscript{39} Id.
\item \textsuperscript{40} Diamond v. Chakrabarty, 447 U.S. 303, 308 (1980).
\item \textsuperscript{41} Id.
\item \textsuperscript{42} Id.
\item \textsuperscript{43} Id.
\item \textsuperscript{44} Id. at 309 (citation omitted).
\item \textsuperscript{45} Id.
\item \textsuperscript{46} Funk Bros. Seed Co. v. Kalo Inoculant Co., 333 U.S. 127, 130 (1948).
\item \textsuperscript{47} Chakrabarty, 447 U.S. at 309.
\item \textsuperscript{48} 333 U.S. at 127.
\end{itemize}
the inventor, gave an advantage over the old method of using each bacterium separately to promote plant growth. The Court noted that such a discovery was in fact very useful, but would not grant a patent because it was no more than discovering the handiwork of nature and repackaging the bacteria. The natural properties of the bacteria should be free for all men to use. A patent must be something more than merely discovering and using a natural principle; it must be a truly inventive idea.

The “laws of nature” and “physical phenomena” exceptions to § 101 patent eligibility have proved to be reasonably manageable. Although not a brightline, the Supreme Court has provided workable guidelines for lower courts to follow. The Federal Circuit has noted that “laws of nature and physical phenomena cannot be invented”; thus, there are somewhat discernable boundaries for what is and what is not patentable. Abstract ideas, on the other hand, have provided courts with particularly tough interpretive problems, especially in the “process” category of § 101. This issue is apparent in recent cases, where the main issues seem to be whether business methods and/or software patents qualify as abstract ideas and are thus unpatentable. The remainder of Part II and the rest of this Note will focus on the abstract idea exception to § 101 and its evolving nature in Supreme Court and Federal Circuit jurisprudence.

B. Evolution of the Abstract Idea Exception

The Supreme Court first began to flesh out an abstract idea exception in a case that involved Samuel Morse’s invention of the telegraph. The case involved questions about the validity of multiple claims, but the most important was claim eight in his patent, which attempted to patent the idea of electromagnetism:

“Eighth. I do not propose to limit myself to the specific machinery . . . in the foregoing specification and claims; the essence of my invention being the use of the motive power of the electric or galvanic current, which I call electro-magnetism, . . . which I claim to be the first inventor or discoverer.”

Clearly, from the language of Morse’s patent, he was trying to claim the exclusive right to any invention that purported to use electromag-
netism for written communication. The Supreme Court was alarmed by the proposition. It correctly perceived that if the patent was upheld as valid, Morse would have a monopoly on communication via electric current. No future invention that used electric current for communication will be allowed during the patent term, even if it was less complicated, cheaper to operate, and more reliable—innovation in that area would be foreclosed.

The Court was also wary of a slippery slope. If Morse could monopolize electric current for communications, new discoveries in other areas of physical science may have enabled him to utilize his telegraph and create a superior new product, thereby gaining a monopoly on the new natural phenomenon as well as the electric current.

The Supreme Court held that Morse’s claim eight was invalid because it was “too broad and not warranted by law.” Although it did not explicitly state its rejection because of a § 101 exception, the case is recognized nowadays as being an influential decision in subject-matter patentability. After stating that claim eight was invalid, the Morse case went on to note that a useful application of a natural law is patentable; here, it is the mechanical telegraph that enabled communication through electromagnetism. Thus, the Supreme Court laid a groundwork for the abstract idea exception: an abstract idea in itself is unpatentable, but the application of said abstract idea is valid if performed through an inventive process or means (in Morse’s case, through his “complicated and delicate machinery,” i.e., the telegraph).

Fast forward over a hundred years, and the Supreme Court once again considered the bounds of subject-matter patentability in what some judges refer to as “the big three:” Gottschalk v. Benson, Parker v. Flook, and Diamond v. Diehr. These cases form the backbone of cur-

58. The telegraph was one of the most important developments of the nineteenth century and kick-started the electronic communications revolution. Since then, wires, cables, satellites, and fibers have been carrying electronic communications powered by electromagnetism. Morse’s invention could have stifled innovation in this industry just as it was beginning to take shape. MERGES & DUFFY, supra note 31, at 114.

59. Morse, 56 U.S. at 113.

60. Morse, 56 U.S. at 114.

61. Morse could not even explain how electromagnetism worked within his new invention.

62. Id.

63. See, e.g., Mayo Collaborative Servs. v. Prometheus Labs., Inc., 132 S. Ct. 1289, 1301 (2012) (using Morse as an example of the prohibition on claiming a natural law because it will inhibit future innovation).

64. Morse, 56 U.S. at 117.

65. Id.


67. Diamond v. Diehr, 450 U.S. 175, 177 (1981) (considering whether a process utilizing a mathematical equation was patentable); Parker v. Flook, 437 U.S. 584, 585 (1978) (considering whether a mathematical formula is patentable if it is limited by post-solution activity); Gottschalk v. Benson, 409 U.S. 63 (1972) (considering whether a mathematical formula not limited to a field or machine is patentable).
rent § 101 analysis and consider the abstract idea question in light of computers and software.68

The first of the “big three” is Benson, which considered the patentability of a mathematical algorithm.69 The patent at issue was a method for programming a general purpose digital computer to convert binary-coded decimal (BCD) numerals to pure binary numerals.70 As the Supreme Court noted, “The claims were not limited to any particular art or technology, to any particular apparatus or machinery, or to any particular end use.”71 The algorithm, if patentable, could be used in any field of study and on any existing or future-devised machinery.72 Additionally, the claimed algorithm could be performed by a human without a computer.73 The Court held the claimed process unpatentable because it was abstract and too sweeping.74 The Court noted that abstract intellectual concepts are not patentable because “they are the basic tools of scientific and technological work.”75 The algorithm in Benson was essentially an idea, which is not patentable.76 The mathematical formula involved in the case did not have practical use outside application on a digital computer.77 Thus, if the patent was granted, it would “wholly preempt the mathematical formula and in practical effect would be a patent on the algorithm itself.”78

The Benson Court was concerned with granting an inventor a monopoly on a general field of science or technology.79 Here, it would have been a monopoly on converting BCD numerals to pure binary numerals in any application on any type of digital computer device.80 Additionally, the Court was careful to make a narrow ruling, saying essentially that a mathematical algorithm on its own is unpatentable.81 Because the Court did not lay out any per se rules, questions remained regarding what types or applications of mathematical formulas were patentable subject mat-

68. See Diehr, 450 U.S. at 177; Flook, 437 U.S. at 585; Benson, 409 U.S. at 64. This Note will later analyze how Bilski and Mayo affected § 101 analysis and point out that the “big three” were only reemphasized and remain viable law today.
69. 409 U.S. at 64.
70. Id. at 65 (stating the claimed method, a process to solve mathematical problems, is known as an algorithm).
71. Id. at 64.
72. Id. at 68.
73. Id. at 67.
74. Id. at 68.
75. Id. at 67.
76. Id. at 71.
77. Id.
78. Id. at 72.
79. See id. at 68.
80. See id. at 68 (stating the patent could be used to foreclose innovation in a diversity of fields both now and in the future).
The Supreme Court addressed some of these concerns six years later in *Flook*.

In *Flook*, the patent at issue was a method for updating alarm limits in a catalytic conversion via a novel mathematical formula. The claimed method amounted to (1) measuring the current level of variables in the catalytic conversion, (2) an intermediate step of calculating the new alarm limit with the math equation, and (3) adjusting the system to reflect the calculated alarm limit. The only difference from the old, conventional method for calculating alarm limits was the addition of an apparently novel mathematical formula. Thus, the issue here was whether a novel mathematical formula was patentable because it was confined to a particular industry (catalytic conversion of hydrocarbons) and was part of a larger process (measuring variables and adjusting the system).

Although the line between a patentable process and an unpatentable abstract idea is often unclear, the Court in *Flook* pointed out an important distinction between the two: “The process itself, not merely the mathematical algorithm, must be new and useful. Indeed, the novelty of the mathematical algorithm is not a determining factor at all.” Thus, the ruling in *Benson*—that a mathematical algorithm on its own is unpatentable—continued to be true. Furthermore, the important consideration was whether a process on the whole is patentable; the fact that there is a mathematical formula involved is only one consideration. The Court went so far as to consider mathematical formulas, no matter how novel, as prior art and “well known.”

The patent in *Flook* was held to be unpatentable because the process, taken as a whole, was not inventive. Once the mathematical formula is taken away from the process, all that was left was very well-known and conventional steps. Thus, *Flook* stands for the proposition that insignificant post-solution activity can never make an unpatentable abstract idea a patentable process—the additional steps must be inventive. However, an abstract idea used within a process, such as a mathematical algorithm, is patentable so long as the process itself is patentable.

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82. See Donald S. Chisum, *The Patentability of Algorithms*, 47 U. PITT. L. REV. 959, 1007 (1986) (“Benson held that something is per se unpatentable but failed to provide reasoning that could be applied to determine the scope of the per se rule.”).
84. *Id.* at 585.
85. *Id.* at 585–86.
86. *Id.* at 587–88.
87. *See id.* at 589 (“The line between a patentable ‘process’ and an unpatentable ‘principle’ is not always clear.”).
88. *Id.* at 591.
89. *See id.* at 592 (“We think this case must also be considered as if the principle or mathematical formula were well known.”).
90. *Id.* at 594.
91. *Id.* (“The chemical processes involved in catalytic conversion of hydrocarbons are well known, as are the practice of monitoring the chemical process variables, the use of alarm limits to trigger alarms, the notion that alarm limit values must be recomputed and readjusted, and the use of computers for ‘automatic monitoring-alarming.’”).
Finally, in Diehr, the Supreme Court considered the patentability of a process for molding precision synthetic rubber products. The claim described a step-by-step process that included loading raw rubber into a mold and ending the process with a cured rubber which is chemically different. In several steps of the process, a mathematical equation was used to constantly recalculate the optimal rubber cure time. The Court held the process to be patentable because it transformed uncured rubber “into a different state or thing.” The Court stated that, although mathematical algorithms on their own are unpatentable, the equation here was only one part of a patentable process.

The Diehr decision stressed the importance of looking at a process in its entirety and gave an example of when an abstract idea such as a mathematical equation can be patented. Again, the Court was concerned with preempting innovation in a field of study. The process in Diehr was patentable because “[the patentee seeks] only to foreclose from others the use of that equation in conjunction with all of the other steps in their claimed process.” Moreover, the Court stresses the importance of looking at the patent as a whole and that it is inappropriate to dissect claims into old and new elements. The process here is “nothing more than a process for molding rubber products” where the mathematical equation plays but one part; it is not the naked attempt to patent only a mathematical algorithm like in Benson. As the Court says, “It is now commonplace that an application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.”

The holdings in Benson, Flook, and Diehr have formed general principles for abstract idea analysis that have guided courts for the last quarter century. First, an abstract idea on its own can never be patented. The Supreme Court is concerned that patenting abstract ideas
would preempt use of fundamental truths, and thus stifle innovation.\(^\text{105}\) Second, conventional post-solution activity can never make an abstract idea patentable.\(^\text{106}\) Third, when determining whether a claimed process utilizing an abstract idea is patentable, look to the process as a whole.\(^\text{107}\) Breaking the process down into new and old steps is not valid, though, because many patentable processes are merely a novel rearrangement of old steps.\(^\text{108}\) Finally, limiting the use of an abstract idea to a particular industry will not make it patentable.\(^\text{109}\)

Although the Supreme Court tried to clarify rules concerning abstract ideas and § 101 subject-matter eligibility, it left much confusion.\(^\text{110}\) What exactly is an abstract idea? The rationale for excluding abstract ideas is to prevent stifling innovation, so looking to the preemptory potential of a patent may be a good start. Additionally, the Supreme Court did not give clear guidance on how novel a process had to be to overcome an abstract idea. \textit{Diehr} gave an example of a patentable process containing an abstract idea, but the Court ruled narrowly and did not give any per se rules.\(^\text{111}\)

For almost thirty years following the trilogy, the Federal Circuit struggled to create rules, tests, and formulations that applied § 101 precedent to ever expanding fields of technology.\(^\text{112}\) Then, as if a sign of things to come, a dissenting opinion authored by Justice Breyer, joined by Justice Stevens and Souter, touched on the general confusion over § 101 subject-matter eligibility.\(^\text{113}\) The case was initially granted certiorari but was then dismissed as improvidently granted.\(^\text{114}\) Justice Breyer wrote a scathing opinion criticizing the dismissal and touching on § 101 doctrine.\(^\text{115}\) Regarding the lack of clarity in § 101 jurisprudence, he stated, “I believe that important considerations of the public interest—including that of clarifying the law in this area sooner rather than later—argue strongly for our deciding the question presented now.”\(^\text{116}\) He admitted that § 101 law, especially issues such as the abstract idea exception, “is

\(^\text{105.}\) See, e.g., \textit{Diehr}, 450 U.S. at 187 (giving an example of an invention that they claim would not stifle innovation).

\(^\text{106.}\) See \textit{Flook}, 437 U.S. at 594–95 (holding that the patentee’s claim was not a patentable process because it was merely inserting a novel mathematical equation into a conventional process).

\(^\text{107.}\) \textit{Diehr}, 450 U.S. at 192.

\(^\text{108.}\) \textit{Id.}

\(^\text{109.}\) \textit{Id.} at 191 (“[T]his principle cannot be circumvented by attempting to limit the use of the formula to a particular technological environment.”).

\(^\text{110.}\) See \textit{Chisum}, supra note 82, at 999 (“While the Court’s apparent reluctance in \textit{Diehr} to expand the scope of the \textit{Benson} rule on the nonpatentability of algorithms is reassuring, it does little to clarify the parameters of that rule.”).

\(^\text{111.}\) See \textit{Diehr}, 450 U.S. at 191–92 (stating generally why the particular patent was valid and reemphasizing previous rules from \textit{Benson} and \textit{Flook}).


\(^\text{114.}\) \textit{Id.} at 125.

\(^\text{115.}\) \textit{Id.} at 132 (Breyer, J., dissenting) (“I believe we should answer [the § 101] question.”).

\(^\text{116.}\) \textit{Id.} at 134.
not easy to define.” To Justice Breyer, though, the current case was a clear instance where the claimed patent fell outside the bounds of § 101 and was clearly unpatentable because it was a natural law. Answering that question would have been helpful to “diminish legal uncertainty” and would have allowed a generalist court to weigh in on the right scope of patent law in our society.

C. The Current § 101 Debate

Four years after Justice Breyer’s passionate dissent, the Supreme Court finally took the opportunity to consider § 101 in *Bilski v. Kappos* and then again in *Mayo Collaborative Servs. v. Prometheus Labs., Inc.* Both cases analyzed the scope of § 101 exceptions: laws of nature, natural phenomenon, and abstract ideas. Moreover, the Federal Circuit has ruled on eight cases since *Bilski* that have further refined caselaw and interpreted the Supreme Court’s recent precedent regarding § 101’s scope. Thus, § 101 is currently in a state of flux as it once again must adapt to address changes in society and new technologies. The following section will look at these recent cases and attempt to outline the current state of the abstract idea exception.

III. ANALYSIS

The debate over § 101’s scope and the abstract idea exception is primarily a substantive question; specifically, where is the dividing line between what is patentable subject-matter and what is an unpatentable abstract idea? The Supreme Court and Federal Circuit have offered numerous opinions that are unclear and contradictory, leaving much confusion on the topic. The following analysis will touch on each of these judicial opinions and attempt to trace the contours of the abstract idea exception in its recent evolution.

Interpreting the development of subject-matter patentability can best be addressed by viewing the decisions in their temporal sequence. Thus, Section III.A first reviews *Bilski* and subsequent Federal Circuit
cases pre-\textit{Mayo}, outlining each opinion’s reasoning and summarizing key themes. Section III.B then reviews \textit{Mayo} and subsequent Federal Circuit opinions addressing § 101. Finally, section III.C offers a graphical summary of these Federal Circuit cases and reflects on the current state of the abstract idea exception.

\textbf{A. The Bilski Cases (June 2010–March 2012)}

The Supreme Court’s 2010 decision in \textit{Bilski} must be read with previous Federal Circuit precedent in mind. After the trilogy of Supreme Court cases in \textit{Benson}, \textit{Flook}, and \textit{Diehr}, the Federal Circuit began crafting guidelines to address § 101 analysis and the abstract idea exception. In 1998 after years of ruling generally on § 101 with no clear framework,\textsuperscript{123} it created a new test and held that an invention was patentable so long as it produced a “useful, concrete, and tangible result,” even if the result was one expressed in numbers.\textsuperscript{124} This remained the general rule in § 101 analysis until the Federal Circuit again enunciated a rule in \textit{In re Bilski}, the case which was ultimately granted \textit{certiorari} and heard by the Supreme Court.\textsuperscript{125} The Federal Circuit again crafted a rule, this time called the machine-or-transformation test: “A claimed process is . . . patent-eligible under § 101 if: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing.”\textsuperscript{126} This test purported to be a per se rule for the patentability of processes and replaced all previously created § 101 tests, including the “useful, concrete, and tangible result” analysis.\textsuperscript{127}

When the Supreme Court considered \textit{Bilski v. Kappos}, it had a chance to weigh in on previous Federal Circuit precedent and to readdress its previous § 101 opinions, specifically with regard to abstract ideas. The invention at issue in \textit{Bilski} was a procedure that explained how buyers and sellers of commodities in the energy market could hedge against price fluctuations.\textsuperscript{128} In addition to explaining how to hedge risk, the patent application articulated the explanation as a mathematical formula.\textsuperscript{129}

Before the Court even touched on the claimed invention’s patentability, it explicitly rejected the Federal Circuit’s machine-or-transformation test as the sole test for process patentability.\textsuperscript{130} Previously, the Supreme Court defined patentable subject-matter broadly, opting

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\item\textsuperscript{123} Mark A. Lemley et al., \textit{Life After Bilski}, 63 STAN. L. REV. 1315, 1318 (2011).
\item\textsuperscript{124} State St. Bank & Trust Co. v. Signature Fin. Grp., Inc., 149 F.3d 1368, 1373 (Fed. Cir. 1998) (internal quotation marks omitted), abrogated by \textit{In re Bilski}, 545 F.3d 943 (Fed. Cir. 2008).
\item\textsuperscript{125} 545 F.3d 943 (Fed. Cir. 2008) (en banc).
\item\textsuperscript{126} \textit{Id.} at 954 (“The Supreme Court . . . has enunciated a definitive test to determine whether a process claim is tailored narrowly enough to encompass only a particular application of a fundamental principle . . . .”).
\item\textsuperscript{127} \textit{Id.} at 959–61.
\item\textsuperscript{128} \textit{Bilski v. Kappos}, 130 S. Ct. 3218, 3223 (2010).
\item\textsuperscript{129} \textit{Id.}
\item\textsuperscript{130} \textit{Id.} at 3226 (“Adopting the machine-or-transformation test as the sole test . . . violates [§ 101]. . . .”) (emphasis added).
\end{enumerate}
\end{footnotesize}
to use dictionary definitions and common usage.  Therefore, when the Federal Circuit created the machine-or-transformation test as the sole test for a patentable process, it violated the Supreme Court’s instructions on § 101 interpretation. The Court determined there is no common meaning of process that would require an invention to be linked to a machine or transformed into another thing. In rejecting the machine-or-transformation test as the only test, the Supreme Court decided not to foreclose use of the test completely. It concluded that the test was a “useful and important clue... for determining... [the patentability of] processes under § 101.”

After dispensing of the machine-or-transformation test as the sole test for process patentability, the Court next moved onto the patentability of business methods in general. The majority in Bilski acknowledged that business patents raise some special problems associated with vagueness and suspect validity because the Information Age empowers more efficient ways to handle general business tasks. Nonetheless, the Supreme Court held that business method patents can be patented so long as they meet general § 101 guidelines, implying that the abstract idea exception in this case could be used as a filter.

With the Supreme Court’s ruling against a categorical ban on business method patents, patent owners “dodged a bullet.” In a concurring opinion authored by Justice Stevens, four Justices argued that business methods should be banned altogether. They argued that allowing business method patents would likely stifle innovation rather than promote it. Because business methods are usually “big ideas,” and usually the basic tools of commercial work, the concurrence essentially said that they are always too abstract and would preempt use of important general principles. It seems that the concurrence assumes some business patents would slip past § 101’s abstract idea exception, which is designed to stop the deleterious effects of overly broad patents. The majority shares this concern with overly broad business methods preempting use of a general principle but contrarily believes § 101’s existing framework.

131. Id. ("The Court has read... 'manufacture' in accordance with dictionary definitions."); see 35 U.S.C. § 101 (2012) ("[P]rocess, machine, manufacture, or composition of matter... ").
132. Bilski, 130 S. Ct. at 3226.
133. See id.
134. Id. at 3227.
135. Id. (emphasis added).
136. Id. at 3229 ("The Information Age empowers people with new capacities to perform statistical analyses and mathematical calculations with a speed and sophistication that enable the design of protocols for more efficient performance of a vast number of business tasks.").
137. See id.
138. See Lemley et al., supra note 123, at 1319.
139. Rumor had it the concurring opinion was supposed to be the majority opinion. See id. at 1319 n.19.
140. Bilski, 130 S. Ct. at 3253–53 (Stevens, J., concurring) (performing a historical survey of patent law and concluding that the term “process” should exclude business methods).
141. Id. at 3254.
142. Id. at 3255.
143. See id.
and abstract idea exception can prevent patenting of particularly undeserving “big ideas.”

After dispensing of the machine-or-transformation test and business method questions, the Court quickly addressed the substantive question of whether the claimed risk hedging invention was patentable. It concluded the claims at issue were unpatentable abstract ideas because they merely explained the basic concept of hedging and protecting against risk. The Court reasoned that “[h]edging is a fundamental economic practice long prevalent in our system of commerce and taught in any introductory finance class.” It seemed to reach its conclusion based on reasoning in Benson and Flook but never explicitly elaborated why the invention was abstract. The only other support for its conclusion was that a patent on risk hedging would preempt the approach in all fields.

The Bilski decision seems to take a back-to-basics approach to § 101 jurisprudence. Aside from weighing in on general law (such as the viability of the machine-or-transformation test and business patents), the Court’s analysis amounts to reviewing old case law and applying it, while only briefly discussing the actual merits of Bilski’s invention. Scholars were quick to point out that the Bilski decision did little to provide guidance on why the invention was unpatentable. The Court itself even seems to recognize the lack of any clear rules, encouraging the Federal Circuit to create its own set of limiting principles for § 101. Justice Stevens, in the concurring opinion, stated the Court’s “mode of analysis (or lack thereof) may have led to the correct outcome... but... the Court’s musings on [the abstract idea exception] stand for very little.”

1. The Federal Circuit Response to Bilski

The Federal Circuit struggled with the Bilski opinion and the abstract idea exception. In five cases following Bilski, the Court attempted to devise its own formulation for a substantive abstract idea test. During this period, the Court adopted a passive role and failed to craft any definitive test to identify abstract ideas. Further evidence of the confusion...
sion and disagreement surrounding § 101 is the fact that one of the five cases heard by the Federal Circuit following *Bilski* has already been vacated and remanded by the Supreme Court.\footnote{156. Ultramercial, LLC v. Hulu, LLC, 657 F.3d 1323 (Fed. Cir. 2011), vacated sub nom. WildTangent, Inc. v. Ultramercial, LLC, 132 S. Ct. 2431 (2012) (mem.) (remanding for consideration in light of *Mayo*).}

The Federal Circuit first ruled on § 101 post-*Bilski* in *Research Corp. Techs., Inc. v. Microsoft Corp.*\footnote{157. 627 F.3d at 859.} The patent at issue related to a process for generating an electronic display and print images using only a small amount of pixel colors while appearing to present many more colors than were actually used.\footnote{158. Id. at 862–63.} The Federal Circuit reviewed the *Bilski* opinion and acknowledged the Supreme Court’s lack of guidance on the abstract idea exception, pointing out its invitation for the Federal Circuit to devise a new test.\footnote{159. Id. at 868.} From that starting point, the Federal Circuit defined abstract as a “disqualifying characteristic [that] should exhibit itself so manifestly as to override the broad statutory categories of eligible subject matter . . . .”\footnote{160. Id.} The Court viewed abstract ideas as a threshold matter that should very clearly violate the Patent Act before an invention could be found unpatentable. Under this narrow definition, the Federal Circuit found the claimed invention to be patentable subject matter.\footnote{161. Id.}

The Court supported its conclusion by stating that the process at issue “presents functional and palpable applications in the field of computer technology” and “address[es] a need in the art.”\footnote{162. Id. (internal quotation mark omitted).} Additionally, the fact that the process had substantial ties to physical machinery seemed to weigh heavily on the Court.\footnote{163. Id. at 869 (referencing the high contract film, film printer, memory, and a printer and display devices).}

The following year, the Federal Circuit considered the abstract idea exception again in *CyberSource Corp. v. Retail Decisions, Inc.*\footnote{164. 654 F.3d 1366 (Fed. Cir. 2011).} The invention at issue was a process and system for detecting fraud in a credit card transaction between a consumer and a merchant over the Internet.\footnote{165. Id. at 1367.} The Court began by classifying the claim as an unpatentable mental process, a subcategory of abstract ideas, because the claimed process could be performed entirely in the human mind.\footnote{166. Id. at 1371–72 (“*[A]pplication of [only] human intelligence to the solution of practical problems is no more than a claim to a fundamental principle.*” (quoting *In re Bilski*, 545 F.3d 943, 965 (Fed. Cir. 2008))).} The Federal Circuit next used the machine-or-transformation test to decide if there were additional claim limits to turn the mental process into patentable subject matter.\footnote{167. Id. at 1375.} It ultimately rejected the claim because it was not significantly lim-
ited by a computer and it did not transform anything.168 Even though the unpatentable mental process was tied to a particular machine, the Court pointed out that the computer simply executed the underlying abstract method of credit fraud detection without adding any significant limitations.169 Moreover, the Court found the claimed system did not even satisfy the transformation prong of the test because the mere manipulation and reorganization of data was not enough.170 Thus, the Court held that insignificant use of a computer cannot turn an otherwise unpatentable mental process into patentable subject matter—a software implementation must do more than simply perform an unpatentable mental process.171

The Federal Circuit next dealt with a similar technology in Dealertrack, Inc. v. Huber, again finding the subject matter to be an unpatentable abstract idea.172 The claimed invention was a computer-aided method and system for processing credit applications over electronic networks.173 The Court reasoned the claimed process was abstract because it was “preemptive of a fundamental concept or idea that would foreclose innovation in this area.”174 In reaching that conclusion, the Court performed a similar analysis to Bilski and broke down each step in the claim to show the underlying invention explained the basic concept of processing information through a clearinghouse.175 Additionally, similar to CyberSource, the Court rejected the contention that the process’s performance on a computer made it patentable.176 The Court suggested a computer limitation may make an abstract process patentable if the claims specify how the computer hardware and database are specially programmed to perform the underlying process.177

The final Federal Circuit decision directly addressing § 101’s substance prior to the Mayo decision was Fort Properties, Inc. v. American Master Lease LLC.178 The claimed invention was “an investment tool designed to enable property owners to buy and sell properties without incurring tax liability” by using a computer to aggregate property portfolios and take advantage of a tax law exception.179 The Court characterized the claimed invention as an investment tool used in the real estate indus-

168. Id. at 1374–75.
169. Id. at 1375.
170. Id. (“The mere manipulation or reorganization of data, however, does not satisfy the transformation prong.”).
171. Id. (“The machine ‘must play a significant part in permitting the claimed method to be performed.’” (quoting SiRF Tech., Inc. v. Int’l Trade Comm’n, 601 F.3d 1319, 1333 (Fed. Cir. 2010))).
172. 674 F.3d 1315 (Fed. Cir. 2012).
173. Id. at 1317.
174. Id. at 1333.
175. Id.
176. Id. (stating that “computer aided” was just as abstract as the underlying process).
177. Id. (suggesting that the claims may have been allowed if they showed how the computer aided the method, the extent of the aid, or the significance of a computer to its performance).
179. Fort Props., 671 F.3d at 1318.
try to enable tax-free property exchanges and concluded that it is an un-patentable abstract idea.\textsuperscript{180} Even though it was tied to the physical world through deeds and real property, those ties were insufficient to render the abstract idea patentable.\textsuperscript{181} Unfortunately, the Court never elaborated why the particular idea is abstract but simply stated the idea was similar to that in \textit{Bilski} and, based on the similarity, concluded it was abstract.\textsuperscript{182} The Court continued its analysis and found that the abstract idea could not become patentable by simply adding a computer.\textsuperscript{183} Its line of reasoning was consistent with past opinions and stated that for the addition of a computer to make an abstract idea patentable, it “must impose a meaningful limit[] on the claim’s scope.”\textsuperscript{184} In \textit{Fort Properties}, the claimed addition of a computer was found to be insignificant post-solution activity and therefore could not transform the abstract idea into patentable subject matter.\textsuperscript{185}

2. \textit{Common Themes Leading up to Mayo}

One overarching theme present in all four cases is their application of the machine-or-transformation test to determine whether an idea is patentable subject matter, although some of them do so implicitly.\textsuperscript{186} After determining that the claimed process or method is directed to an abstract idea, the cases then consider whether the addition of a computer or other “machine” limitation to the process can make it patentable.\textsuperscript{187} Thus, for the invention to pass the machine prong of the machine-or-transformation test, a computer must “impose a sufficiently meaningful limit on [a] claim’s scope.”\textsuperscript{188}

Another common thread in these cases is the importance of determining whether the claimed invention should even be categorized as an abstract idea. The Federal Circuit on multiple occasions has made the determination that an invention is in fact abstract, but it did so in a \textit{Bilski}-esque fashion that did little to define what exactly makes an abstract idea abstract.\textsuperscript{189} In essence, the Court has taken the position that it knows an abstract idea when it sees one and so should everyone else.\textsuperscript{190} Although not expressly stated in the opinions, one major factor seems to be the preemptory power of the claimed invention. For example, in \textit{Cy-
bergerSource, Dealertrack, and Fort Properties, the Federal Circuit took the stance that each idea, if patented, would foreclose innovation in a large area.\footnote{See Fort Props., 671 F.3d at 1322; Dealertrack, Inc. v. Huber, 674 F.3d 1315, 1333 (Fed. Cir. 2012); CyberSource, 654 F.3d at 1372.} While the Court states its belief in the preemptory power of each idea,\footnote{Id.} it fails to elaborate the scope of preemption necessary for an idea to pass from the threshold of abstract to patentable.

Research Corp. is the only example in this group of cases that offers guidance on an idea that is not abstract.\footnote{See Research Corp. Techs., Inc. v. Microsoft Corp., 627 F.3d 859, 868–69 (Fed. Cir. 2010).} The claimed invention in that case was found not abstract because it had a palpable application in a particular field and was implemented using particular computer equipment.\footnote{Id.} Similar to the Supreme Court decision in Diehr, the Federal Circuit found the process, taken as a whole, was patentable.\footnote{Id. at 869.} The Court felt comfortable framing the invention as a patentable process due to its ties to physical machinery and its limited application.\footnote{Id.} It did not clearly say what it means to “manifestly override” § 101’s broad statutory categories; rather, it merely says the particular invention was not abstract.\footnote{Id. at 868–69 (“The invention presents functional and palpable applications in the field of computer technology.”) (emphasis added).}

The necessary physical steps in the process and the patent’s constraint to a particular field seemed to make the difference between an unpatentable abstract idea with insignificant post-solution activity and a patentable process.\footnote{Id. at 868–69 (“[Mayo] did not ‘do little to disrupt the law,’” it instead “reminded us that the Supreme Court always has a leg up on [patent practitioners].”\footnote{See Denise DeFranco, Mayo: A Force To Be Reckoned With, LANDSLIDE, July-Aug. 2012, at 25.}} In other words, the additional steps added *enough* to turn the math formulas into a patentable application of the abstract idea.

**B. The Mayo Cases (March 2012–present)**

The Supreme Court in *Mayo Collaborative Servs. v. Prometheus Labs., Inc.* had a chance to elaborate on what is *enough*: what extra steps can turn an abstract idea into a patentable process?\footnote{132 S. Ct. 1289 (2012).} But instead of answering that question, the opinion has been interpreted to offer little in clearing up § 101 jurisprudence.\footnote{Chao, supra note 20, at 90 (“Mayo has created a kind of pessimistic uncertainty.”).} Many practitioners were nervous when the Supreme Court granted *certiorari* to the case and upon issuance of the decision did “a collective eye roll.”\footnote{Id.} As one commentator put it, “[Mayo] did not ‘do little to disrupt the law,’” it instead “reminded us that the Supreme Court always has a leg up on [patent practitioners].”\footnote{Id.}

The patents at issue in Mayo related to medical diagnostic methods for autoimmune diseases such as Crohn’s disease.\footnote{Id., 132 S. Ct. at 1294–95.} The claimed inven-
tion was a method for correlating between the level of an individual’s 6-thioguanine metabolite in the blood and the proper dosage of a thiopurine compound to treat the disease. The Supreme Court began its analysis by assuming that the claimed method set forth laws of nature and could not be patentable subject matter “unless [the] process [had] additional features that provide[d] practical assurance that the process is more than a drafting effort designed to monopolize the law of nature itself.” Although Mayo considered the law of nature exception to § 101, the analysis can be carried over to abstract idea analysis—in both instances, there must be an application of an idea, and Mayo purports to show what is a patentable application (or what is not).

The Supreme Court framed the issue by asking: “[D]o the patent claims add enough to their statements of the correlations to allow the processes they describe to qualify as patent-eligible processes that apply natural laws?” The Court found they did not. It broke down the claim to its constituent parts: (1) an “administering” step that simply referred to the relevant audience (doctors), (2) a “wherein” step that told the doctors about the relevant natural laws, and (3) a “determining” step that told doctors to measure the metabolite level. Upon looking at each individual step, the Court determined that all steps were conventional and obvious pre-solution activity, thus they could not transform the natural law into patentable material. Additionally, when it considered all the steps as an ordered combination, it also found the steps added nothing new to the natural law. Finally, the Court addressed the machine-or-transformation test in regard to the claimed invention, particularly the transformation prong. It quickly rejected that the process transformed blood in any meaningful way and reiterated that even if it did, the test was only a clue that should not trump the law of nature exclusion.

The Supreme Court tried to harmonize its decision in Mayo with past precedent in Flook and Diehr, attempting to shed further light on the reasoning behind its decision. Instead of explaining why the additional steps in Mayo did not sufficiently add enough to the natural law, the Court simply said the claims cited before them presented a weaker

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204. Effective thiopurine dosages varied for each individual depending on how the person’s body metabolized the drug. The claimed invention was a correlation between an individual’s 6-thioguanine metabolite level and the correct drug dosage. Id.
205. Id. at 1297.
206. See Chao, supra note 20, at 90–91 (explaining that Mayo has impacts on all unpantentable concepts).
207. Mayo, 132 S. Ct. at 1297 (emphasis in original).
208. Id. at 1298.
209. Id. at 1297.
210. See id. at 1298 (citing Parker v. Flook, 437 U.S. 584, 590 (1978)).
211. Id.; see Diamond v. Diehr, 450 U.S. 175, 188 (1981) (“[A] new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination was made.”).
212. Mayo, 132 S. Ct. at 1302–03.
213. Id. at 1303.
214. Id. at 1299.
case for patentability than Diehr (patent-eligible) and a no stronger case than Flook (not patent-eligible). Commentators have explained that until the Supreme Court elaborates on how certain limitations and additional steps can transform an otherwise unpatentable concept into patent eligible subject matter, patentable subject matter determinations will continue to be unpredictable. Other commentators have even argued that Mayo crafts a new methodology for analyzing § 101 patentability questions. They argue “[t]he new methodology involves taking a ‘quick peek’ (as it was described during oral arguments) at novelty and nonobviousness in assessing eligibility under § 101.” The Supreme Court emphasized that additional limitations to unpatentable concepts should provide an “inventive concept” to ensure that the patent amounts to significantly more than just an unpatentable idea, even though the Court in Diehr previously instructed that the novelty of any elements are irrelevant in a § 101 analysis. Thus, Mayo created a kind of pessimistic uncertainty in the patent realm that cast serious doubt on what exactly was patentable.

1. The Federal Circuit Response to Mayo

The Federal Circuit has heard three cases since Mayo which have directly addressed the substance of subject matter patentability. The first of these Federal Circuit opinions to address § 101 post-Mayo was CLS Bank Int’l v. Alice Corp. Pty. Ltd. The patents at issue were methods covering “a computerized trading platform for exchanging obligations in which a trusted third party settle[d] obligations between a first and second party so as to eliminate ‘settlement risk.’” The Federal Circuit began its analysis by noting that the Supreme Court in Mayo did nothing to illuminate when exactly a patent claim is drawn to an abstract idea in the first place and additionally pointed out that this “great uncertainty” has led to “the devaluing of patents of economic potential and practical utility.”

215. Id.; see Chao, supra note 20, at 89 (“[T]hat discussion is unhelpful given the confusion about Flook and Diehr.”).
216. Chao, supra note 20, at 89.
217. See DeFranco, supra note 201, at 26.
220. See Chao, supra note 20, at 90.
222. 685 F.3d 1341, vacated, reh’g en banc granted, 484 F. App’x 559 (Fed. Cir. 2012). This case was granted a rehearing en banc in the Federal Circuit, with oral arguments scheduled for February 8, 2013. CLS Bank, 484 F. App’x at 559.
223. The third party was present to eliminate risk in the event that one party paid its obligation while the other did not. CLS Bank, 685 F.3d at 1343.
224. Id. at 1348–49.
The Court ultimately found the claimed invention to be patentable because it was not manifestly evident that the claims were directed to an ineligible abstract idea.225 The majority’s reasoning seemed to place particular weight on two factors: the preemptory potential of the disputed patent and the machine-or-transformation test.226 In its analysis, the Federal Circuit explained that the underlying goal of § 101 exceptions were to prevent preemption of a fundamental truth, and characterized the machine-or-transformation test as a helpful clue to determine this.227 The claims in CLS Bank all utilized a computer and, as such, were connected to a “machine.”228 Furthermore, the Federal Circuit determined that the computer limitations, when combined with other claim limitations, were sufficient to turn the invention into patent eligible subject matter.229 The Court used a very high “manifestly evident” standard for abstractness.230 Thus, the combination of a high abstractness threshold and the presence of claims that significantly limited the claim scope was enough for the Court to conclude that the patents were valid subject matter. The Court found that “the presence of [computer and other] limitations prevents us from finding it manifestly evident that the claims are patent ineligible under § 101”231 and “do not appear to preempt much in the way of innovation.”232 Although the Court pointed out exact claim limitations that led them to their ultimate conclusion, they never gave a meaningful explanation of why the combination of claim limitations was enough.233

Surprisingly, the Federal Circuit did not once mention the recently published Mayo opinion as it analyzed the particular case facts.234 Judge Prost, in her dissent, criticized the majority for “resist[ing] the Supreme Court’s unanimous directive to apply the patentable subject matter test with more vigor.”235 She pointed out that the majority has fabricated a new rule, i.e., courts must avoid deciding § 101 cases unless the unpatentability is “manifestly evident.”236 Judge Prost argued that the correct interpretation of Mayo and abstract idea analysis in general is to require claims to include an “inventive concept.”237 To her, the proper analysis in

225. Id. at 1352.
226. See id. at 1349–53 (reviewing case law that predominantly emphasized the preemptory potential of abstract ideas and the machine-or-transformation test).
227. Id. at 1349–52 (explaining the machine-or-transformation test was a helpful clue and that adding a computer that imposes meaningful limits was usually sufficient evidence).
228. Id. at 1354.
229. Id. at 1355 (explaining that the computer here did more than in past cases that found inventions to be abstract, such as Bilski, CyberSource, Dealertrack, and Fort Properties).
230. Id. at 1356.
231. Id.
232. Id.
233. See id. at 1355 (pointing out all the claim limitations, but only saying they are enough because when taken as a whole they play a “significant part” in the method).
234. See id. at 1353–57 (focusing on the “Bilski line of cases” as it applied the law to the case).
235. Id. at 1356 (Prost, J., dissenting).
236. Id. at 1357. The standard’s newness may be slightly overstated, as the Federal Circuit in Research Corp. Techs., Inc. v. Microsoft Corp., 627 F.3d 859, 868 (Fed. Cir. 2010) stated: “[An abstract idea] should exhibit itself so manifestly as to override the broad statutory categories of eligible subject matter . . . .”
237. CLS Bank, 685 F.3d at 1357.
CLS Bank was to look at the claimed invention and determine whether there was more than an abstract idea: the claims must contain some “inventive concept” other than an abstract idea. She declined to elaborate on exactly what an “inventive concept” is, but her analysis tended to show it is something approaching a novelty analysis. Judge Prost concluded that the claimed invention had no “inventive concept” and was therefore an unpatentable abstract idea.

Only a few weeks after the CLS Bank opinion was published, the Federal Circuit again ruled on the abstract idea exception in Bancorp Servs., L.L.C. v. Sun Life Assurance Co. of Canada (U.S.). The claimed invention at issue was a method for tracking the book value and market value of life insurance policies and calculating the amount a third-party guarantor must guarantee and pay should the policy be paid out prematurely. The Federal Circuit concluded that the invention was no more than an unpatentable abstract idea. To reach its conclusion, the Court reasoned that the heart of the disputed claims was directed at abstract ideas mainly because it did not meet either prong of the machine-or-transformation test. Aside from finding that the claims failed the machine-or-transformation test, the Federal Circuit did not elaborate on why the particular claims were abstract. Rather, it merely compared them to the Bilski claims and found “there [was] no material difference between the claims,” concluding the Bancorp claims must be abstract and thus unpatentable per Bilski.

The Federal Circuit ended its analysis in Bancorp by considering whether the “performed by a computer” limitation was enough to turn the abstract idea into patentable subject matter. The Court rejected the computer limitation because it did not add a significant part to the claimed invention and reasoned that “without computer limitations nothing remain[ed] in the claims but the abstract idea . . . .” Distinguishing this case from CLS Bank, the Court noted that unlike the invention in CLS Bank, the Bancorp invention did not have computer limitations that played a “‘significant part’” and the overall claims were not directed to a “‘very specific application’ of the inventive concept.” The Bancorp opinion only briefly mentioned the “inventive concept” idea elaborated

238. Id.
240. CLS Bank, 685 F.3d at 1356 (Prost, J., dissenting).
241. 687 F.3d 1266 (Fed. Cir. 2012).
242. Id. at 1269–70.
243. Id. at 1277.
244. Id. at 1278 (“We discern no fault in the conclusion . . . that the asserted claims do not meet either prong of the machine-or-transformation test—which, while ‘not the sole test for deciding whether an invention is a patent eligible process,’ remains ‘a useful and important clue . . . .’” (quoting Bilski v. Kappos, 130 S. Ct. 3218, 3227 (2010)) (internal quotation marks omitted)).
245. Id.
246. Id.
247. Id. at 1278–79.
248. Id. at 1280.
249. Id. (quoting CLS Bank Int’l v. Alice Corp. Pty. Ltd., 685 F.3d 1341, 1355 (Fed. Cir. 2012), vacated, reh’g en banc granted, 484 F. App’x 559 (Fed. Cir. 2012)).
in *Mayo*, but seemed to implicitly find that the computer limitations did not have it.\(^{250}\) Furthermore, the Court also validated *CLS Bank*’s focus on an invention’s preemptive power\(^{251}\) and *Research Corp.*’s focus on inventions that improved existing technologies in the marketplace.\(^{252}\)

Finally, the Federal Circuit directly considered the bounds of abstract ideas in *Association for Molecular Pathology v. U.S. Patent and Trademark Office (Myriad)*.\(^{253}\) One of the claims at issue was a method for comparing or analyzing particular DNA sequences.\(^{254}\) The Court disposed of the claim somewhat quickly and concluded it is only an abstract idea and therefore unpatentable.\(^{255}\) It stated that the “claim . . . recites nothing more than the abstract mental steps necessary to compare two different nucleotide sequences . . . .”\(^{256}\) In its analysis, the Court noted that the method did not apply the abstract steps of comparing two nucleotides in a process, but rather, comparing the DNA sequences was the entire process claimed.\(^{257}\) Additionally, the *Myriad* claims were “indistinguishable” from the *Mayo* claims previously found unpatentable by the Supreme Court.\(^{258}\)

The Federal Circuit in *Myriad* considered another method claim that screened for potential cancer therapeutics via changes in cell growth rates in transformed cells.\(^{259}\) The Court held the claim not abstract because it recited a screening method premised on the use of “transformed” host cells—the cells are nonnaturally occurring and thus patent eligible subject matter.\(^{260}\) Because the claimed method included more than the abstract idea of comparing growth rates, it was patentable subject matter.\(^{261}\) The Court found that the claim does not preempt a field of research because the method is directed at a particular cell that is transformed with specific genes.\(^{262}\)

\(^{250}\) *Id.* (quoting *CLS Bank*, 685 F.3d at 1355).

\(^{251}\) *Id.* (stating that, in *CLS Bank*, the claims were directed at a specific application using a computer that played a significant part).

\(^{252}\) *Id.* at 1279 (stating that, in *Research Corp.*, the claims “represented improvements on computer technologies in the marketplace”).

\(^{253}\) 689 F.3d 1303, 1334–36 (Fed. Cir. 2012). Although two judges did not join the Court’s ultimate opinion, they both concurred with the portion pertaining to the method claims directed at an abstract idea. Additionally, this was the last opinion directly addressing §101 at the time this Note was written. There will undoubtedly be additional caselaw in the future. *See*, e.g., *CLS Bank Int’l v. Alice Corp. Pty. Ltd.*, 484 F. App’x 559 (Fed. Cir. 2012).

\(^{254}\) *Myriad*, 689 F.3d at 1334.

\(^{255}\) *Id.*

\(^{256}\) *Id.*

\(^{257}\) *Id.* at 1334–35.

\(^{258}\) *Id.* at 1335.

\(^{259}\) *Id.*

\(^{260}\) *Id.* at 1336.

\(^{261}\) *Id.* (“[O]nce one has determined that a claimed composition of matter is patent-eligible subject matter, applying various known types of procedures to it is not merely applying conventional steps to a law of nature.”).

\(^{262}\) *Id.* at 1336–37.
C. Summary

There has been much jurisprudence on the substance of § 101 by both the Supreme Court and the Federal Circuit in the past three years. Below is a graph that outlines the relevant Federal Circuit cases since Bilski, the inventions at issue, and the Court’s holding. It is meant to help synthesize a confused topic into a more graphical form and easier reference.

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<td>Process for digital image halftoning</td>
<td>Not abstract; patentable subject matter</td>
<td>Functional and palpable application in a particular field; addresses a need in the art; process tied to physical things</td>
<td>Majority: Radner, Newman, Plager</td>
</tr>
<tr>
<td>Cybersource Corp. v. Retail Decisions, Inc., 654 F.3d. 1366 (Fed. Cir. 2011)</td>
<td>Method and system for detecting fraud in a credit transaction over the Internet</td>
<td>Abstract; not patentable subject matter</td>
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<td>Majority: Bryson, Dyk, Prost</td>
</tr>
<tr>
<td>Dealertrack, Inc. v. Huber, 674 F.3d. 1315 (Fed. Cir. 2012)</td>
<td>Computer-aided method and system for processing credit applications over electronic networks</td>
<td>Abstract; not patentable subject matter</td>
<td>Preemptive of a fundamental concept that would foreclose innovation in an area; addition of “computer-aided” was insignificant</td>
<td>Majority: Linn, Dyk</td>
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<td>Fort Properties, Inc. v. American Master Lease LLC, 671 F.3d. 1317 (Fed. Cir. 2012)</td>
<td>An investment tool designed to enable property owners to buy and sell properties without incurring tax liability</td>
<td>Abstract; not patentable subject matter</td>
<td>The claimed process was similar to Bilski and thus abstract; addition of a computer-aided distinction was insignificant post-solution activity</td>
<td>Majority: Prost, Schall, Moore</td>
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263. Id. at 1303; Bancorp Serv., LLC v. Sun Life Assurance Co. of Canada (U.S.), 687 F.3d 1266 (Fed. Cir. 2012); CLS Bank Intern. v. Alice Corp. Pty. Ltd., 685 F.3d 1314 (Fed. Cir. 2012); Fort Prop., Inc. v. American Master Lease LLC, 671 F.3d 1317 (Fed. Cir. 2012); Dealertrack, Inc. v. Huber, 674 F.3d. 1315 (Fed. Cir. 2012); Cybersource Corp. v. Retail Decisions, Inc., 654 F.3d. 1366 (Fed. Cir. 2011); Research Corp. Tech., Inc. v. Microsoft Corp., 627 F.3d 859 (Fed. Cir. 2010).
| **CLS Bank Intern. v. Alice Corp. Pty. Ltd., 685 F.3d 1341 (Fed. Cir. 2012)** | Method describing a computerized trading platform for exchanging obligations in which a third party settled obligations between a first and second party | Not abstract; patentable subject matter | Use of computer aided limitations played a significant part in the invention; claims were limited to a very specific application; abstractness of claim was not “manifestly evident” | Majority: Linn, O’Malley  
Dissent: Prost |
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<td><strong>Bancorp Serv., LLC v. Sun Life Assurance Co. of Canada (U.S.), 687 F.3d 1266 (Fed. Cir. 2012)</strong></td>
<td>Method for tracking the book value and market value of life insurance policies and calculating the amount a third party guarantor must guarantee and pay</td>
<td>Abstract; not patentable subject matter</td>
<td>Invention did not pass the machine-or-transformation test; the computer use did not play a significant part in performing the invention</td>
<td>Majority: Lourie, Prost, Wallach</td>
</tr>
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| **Ass’n for Molecular Pathology v. U.S. Patent and Trademark Office, 689 F.3d 1303 (Fed. Cir. 2012)** | Method 1: Method for comparing or analyzing particular DNA sequences  
Method 2: Method to screen for potential cancer therapeutics via changes in cell growth rates in transformed cells | Method 1: Abstract; not patentable subject matter  
Method 2: Not abstract; patentable subject matter | Method 1: Simply covers mental steps of comparing two DNA sequences; indistinguishable from Mayo claims  
Method 2: Application of patent eligible material (man-made cells) | Majority: Lourie  
Concurring in part: Moore  
Concurring and dissenting in part: Bryson  
(All judges concurred with respect to these methods) |
1. The Current State of the Abstract Idea Exception

The first overarching theme in the Federal Circuit cases since *Bilski* has been the continued and widespread use of the machine-or-transformation test. Most opinions considered whether there was a machine involved in the process that could transform an otherwise abstract idea into patentable subject matter. Some of the opinions directly stated they were considering the machine-or-transformation test, while others indirectly used it when considering whether a particular physical device (usually a computer) limited the scope of a claim. Thus, the *Bilski* opinion has been very influential, as the Federal Circuit continues to apply the test as a valuable clue. The test's widespread use by the Federal Circuit is strong evidence that it will continue to be used in future § 101 jurisprudence.

A second theme throughout Federal Circuit case law post-*Bilski* has been the Court’s focus on an abstract idea’s preemptory potential. Although it openly admits that the abstract idea analysis itself is unpredictable for defining the scope of an abstract idea, all analyses are performed with the underlying goal of preventing preemption of “fundamental truths” that would stifle innovation. Thus, no matter what way a court comes out in its ultimate determination of a particular claim’s abstractness, its underlying objective is to maintain the Patent Act’s goal of promoting innovation.

A rather new development in the past three years, particularly after *Mayo*, is the idea of using “inventive concept[s]” to measure the abstractness of a particular claim. The current jurisprudence shows a marked disagreement over the meaning of “inventive concept.” Some judges have interpreted *Mayo* as creating a new method for analyzing a claim’s level of abstraction. They argue that the new method is meant to limit the Federal Circuit’s overly broad § 101 rulings. On the other

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265. See, e.g., CyberSource, 654 F.3d at 1375.

266. Id.

267. Dealertrack, Inc. v. Huber, 674 F.3d 1315, 1333 (Fed. Cir. 2012) (discussing the presence of a computer in the process, but never explicitly saying that the analysis was to cover the machine prong of the machine-or-transformation test).


270. See *CLS Bank*, 685 F.3d at 1350 (stating that the essential concern is the extent to which preemption hinders innovation).

271. Id. at 1357 (Prost, J., dissenting) (“Now there is no doubt that to be patent eligible under § 101, the claims must include an ‘inventive concept.’” (citation omitted)).

272. See id. at 1356 (“[T]he Supreme Court reversed us [Federal Circuit] in a § 101 case for the second time in its last three terms, hinting (not so tacitly) that our subject matter patentability test is not sufficiently exacting.”); see also WhitServe, LLC v. Computer Packages, Inc., 694 F.3d 10, 41 (Fed. Cir. 2012) (Mayer, J., dissenting) (stating that under *Mayo’s* inventive concept, there must be a new technology).

273. See, e.g., *CLS Bank*, 685 F.3d at 1356 (Prost, J., dissenting).
hand, there are Supreme Court cases that seem to conflict with this interpretation, and some Federal Circuit opinions regard the “inventive concept” language as just another way of describing previous case law.274 In their view, the “inventive concept” conflicts with a statement in Diehr which instructed § 101 analysis to be completely divorced from any novelty analysis performed under § 102.275

Additionally, the use of a “manifestly evident” standard to weigh subject matter eligibility was recently introduced and has been controversial. The Federal Circuit seems to have utilized this standard to reconcile the unpredictable test for abstract ideas276 and has used it on more than one occasion, seemingly as an escape hatch to avoid defining a concrete test for abstract ideas.277 By setting the threshold of abstractness at a very high level, it is harder to hold that an invention is abstract. Thus, the invention must be obviously abstract to invalidate it under § 101—this takes some of the sting out of making determinations along the very grey line separating abstract ideas from patentable inventions. This approach has been criticized by other judges on the Federal Circuit for dodging the issue and being unfounded in prior Supreme Court or Federal Circuit precedent.278

IV. RECOMMENDATION

Section 101 and the abstract idea exception are valuable tools that help maintain the proper balance in patent law between promoting innovation and granting inventors a monopoly at the expense of society. Some argue, though, that § 101 is superfluous because it is too broad and other laws do the work for it, suggesting that Congress should get rid of § 101 altogether.279 This proposal may seem tempting on its face because it would sidestep the admittedly vague guidelines surrounding abstract idea analysis, but the Supreme Court has rejected this stance.280 Thus, the best course to take for abstract idea analysis is to learn from past precedent and apply § 101 so that it can perform its function of filtering out undesirable inventions while not overburdening courts by forcing them to grapple with its amorphous standards.

A. Controlling District Court Proceedings

Allowing judges to control the timing of a § 101 determination is the best way to address the vague standards surrounding the abstract idea

274. See id. at 1351–52 (majority opinion) (citing Diamond v. Diehr, 450 U.S. 175, 188–89 (1981)).
276. See Research Corp. Techs., Inc. v. Microsoft Corp., 627 F.3d 859, 868 (Fed. Cir. 2010) (saying abstractness should exhibit itself very manifestly so as to override the Patent Act’s goals).
277. See, e.g., CLS Bank, 685 F.3d at 1356 (Prost, J., dissenting).
278. See id.
279. See DeFranco, supra note 201, at 27.
280. Id. at 28.
exception and still accomplish its course filtering objectives. In litigation, a district court making a § 101 decision must search for universal truths and decide whether a particular invention falls within a broad exception seeking to protect innovation. Most judges do not have scientific degrees or engineering backgrounds and are usually ill-equipped to make this determination with any degree of precision. Even judges with scientific credentials struggle to define what is an unpatentable abstract idea. Thus, courts should defer to other provisions of patent law to invalidate a patent and use § 101 as a fallback provision, utilized only when other sections of patent law are inapplicable.

District courts are given much leeway to craft their proceedings and control the litigation process. As such, they are in a unique position to control the timing of a § 101 challenge on a patent. Knowing that there are other sections in patent law which can invalidate a patent (such as the novelty, obviousness, or written description requirement), a district court can elect to consider these other rules before wading into the “murky morass” of § 101. By utilizing this approach, courts will likely inject more certainty into a judicial proceeding, conserve judicial resources, and resolve patent invalidity disputes more quickly. Mayo stated that a court cannot shift a patent validity inquiry entirely onto sections of patent law and disregard § 101, but it never stated that § 101 had to be the very first inquiry in a patent invalidity proceeding. Therefore, a district court should be able to invalidate a patent on obviousness or novelty grounds if it can do so before addressing § 101—the court is not disregarding § 101, rather, it is merely choosing to invalidate a patent on other legitimate grounds.

This does not mean that § 101 can never be a threshold issue and brought up at the beginning of litigation. Sometimes an invention will very clearly go outside the bounds of the abstract idea test and be unpatentable subject matter. In those cases, it would be allowed, and likely preferred, for a district court to use § 101 as the first test. This procedure follows Supreme Court precedent but still allows courts to resolve disputes efficiently and correctly: it continues to recognize the importance of every section of patent law and allows courts to avoid the pitfalls inherent in abstract idea analysis.

### B. A Practical Approach to the Abstract Idea Exception

Sometimes a court may be unable to avoid analyzing an invention under § 101 and the abstract idea test because it is valid under all other patent law sections. In those instances, a court will be bound by Su-

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285. See Mayo, 132 S. Ct. at 1304 (stating that patent-eligibility inquiry should not rest entirely on sections other than § 101).
Supreme Court and Federal Circuit precedent and must decide the case according to established rules. What should lower courts do when confronted with the task of determining patentable subject matter under the unclear standards of § 101 and the abstract idea exception? First, lower courts should continue to use the machine-or-transformation test as a clue to an invention’s patentability under § 101.

While it seems that applying the test to business methods or computer technology is often difficult, a court should at least try to fit the invention into the test’s framework. The Federal Circuit seems to have zealously adhered to the machine-or-transformation test as a very useful clue, even though the test’s usefulness seems to be fading as technology continues to evolve. Until the Supreme Court or Federal Circuit states otherwise, supporting a § 101 analysis with at least a cursory machine-or-transformation test inquiry will lend some support to a lower court’s findings. The test may only be a slight clue, but a slight clue can help inject some clarity into the abstract idea exception.

Additionally, determining the preemptory potential of a claimed invention is very important to a § 101 analysis. Although determining the preemptory potential essentially amounts to searching for universal truths, it is the basic determination that every § 101 inquiry aims to answer. The reason for creating judicial exceptions to § 101 was to limit the innovation-killing effects of patenting certain inventions. Thus, if a court is thoroughly convinced that a certain invention will preempt innovation in a particular field because it claims an abstract idea, it is likely that the particular invention is not patentable subject matter. Defining what sorts of inventions preempt a field is a very hard question, and must be done on a case-by-case basis.

The act of defining an abstract idea is inherently abstract, but this is necessary for § 101 to perform its course filtering duties. As new and unforeseen technologies are introduced into society, existing patent law must have the ability to adapt to these changes. Section 101 is well suited to do this. The case-by-case inquiry that necessarily goes on when determining whether an invention is patentable subject matter allows flexibility to consider the desirability of patenting new technologies. For instance, the rule that a computer must add significant limitations to a process otherwise considered abstract was created in light of the new technology of personal computers. Therefore, while there are some difficulties in administering § 101 because of its broad scope, there are also advantages afforded when it deals with new technologies.

286. Historically, the test was useful when dealing with physical machinery. Nowadays, when the machinery is a personal computer running all kinds of software, the distinction is not so clear.
V. CONCLUSION

In the last three years, the Supreme Court has issued two opinions considering the bounds of § 101 but did little to clear up an already confused topic. The Federal Circuit is sharply divided on how to interpret § 101 and has yet to craft a coherent rule to guide lower courts and practitioners. Section 101 and the abstract idea, though, are inherently abstract, making it unlikely the vagueness in this area of law will be clarified anytime soon. Thus, moving forward, § 101 and the abstract idea should only be used by courts as a last resort. It is still a useful tool to filter out undesirable patents and promote patent law’s aim of promoting innovation, but its ambiguities can often overwhelm. By shaping the litigation process pragmatically, courts can dispose of patent validity proceedings more efficiently and will not have to spend as much time searching for universal truths.

POSTSCRIPT

Since this Note was originally completed in March 2013, there has been much activity in §101 and abstract idea jurisprudence.288 Not surprisingly, the judicial opinions have shown much disagreement about the scope of the abstract idea.289 Notably, the Federal Circuit finally issued the en banc opinion in CLS Bank Int’l v. Alice Corp. Pty. Ltd. on May 10, 2013, thus weighing in on the merits of the case twice in a one-year span and reaching opposite conclusions.290 In this recent en banc decision, there was only one opinion that garnered a majority of the ten-judge panel.291 The one paragraph per curium opinion simply stated that the trial court’s holding was affirmed and that the inventions at issue were not patentable subject matter.292 Following the very brief holding, the Federal Circuit panel spewed sixty-three pages of non-precedential concurrences and dissents, and did little to shine any light on a coherent abstract idea rule.293

Some commentators believe that the en banc CLS Bank decision or the recently decided Ultramercial, Inc. v. Hulu, LLC294 are ripe for Su-
preme Court review. At the time of this writing, both cases have petitions for writ of certiorari pending and are currently being briefed.

Section 101 and the abstract idea exception are in desperate need of clarification, but it is unclear whether the uncertainty can be cleared up any time soon. Only time will tell if the Supreme Court will again weigh in on the abstract idea exception and if they can once and for all clear up this area of the law.

--November 3, 2013


