As a threshold matter, what types of things are patentable? What types of things are not? Section 101 of the Patent Act lists four big categories: “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.”\(^1\) The operative language has scarcely changed since it was first enacted in 1793.\(^2\)

Most patent claims to products fit squarely within one of the three product-style categories and thus cause no analytical difficulties. From fluoxetine hydrochloride, the active ingredient in Prozac (U.S. Patent No. 4,314,081), to bubble wrap (U.S. Patent No. 3,142,599), to the air-
plane (U.S. Patent No. 821,393), practical solutions to concrete problems fall comfortably within the scope of § 101. The patent system had more difficulty analyzing the patentability of genetically modified organisms, but the Supreme Court resolved the issue 30 years ago, in *Diamond v. Chakrabarty*, when it held that they are “manufactures” for Patent Act purposes.

The “process” category, by contrast, continues to vex the patent system. Industrial processes—curing rubber, cracking oil, tanning leather, grinding flour, turning wood—are not the problem. Computer-implemented processes and, more generally, business methods continue to raise tough questions at § 101’s outer boundary. This is so because the Supreme Court has long held that the categories in § 101, although broad, have limits: “Excluded from such patent protection are laws of nature, natural phenomena, and abstract ideas.” A process, claimed separately from the device or materials used to practice it, is already more abstract than a claim to a product. But is it too abstract? What criterion, other than “abstractness” itself, can we use to decide whether a process claim is fatally abstract? In 2010, the Supreme Court returned to the debate in the business-methods case of *Bilski v. Kappos*, after a long hiatus since its computer-process trilogy of *Gottschalk v. Benson*, *Parker v. Flook*, and *Diamond v. Diehr*. This symposium issue of the *Lewis & Clark Law Review* presents papers from the leading theorists on the scope of § 101’s “process” category.

My goal in this brief Essay is to introduce the symposium papers by describing the basics of the *Bilski* case. I also offer a brief thought about where interested observers might turn next in the U.S. Court of Appeals for the Federal Circuit’s § 101 jurisprudence for insights about how that court may implement *Bilski*’s unmistakable revival of *Benson* and *Flook*. Specifically, now that the 15-year *Alappat/State Street* misadventure, with

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3 447 U.S. 303, 310 (1980) (“[T]he patentee has produced a new bacterium with markedly different characteristics from any found in nature and one having the potential for significant utility. His discovery is not nature’s handiwork, but his own; accordingly it is patentable subject matter under § 101.”). Since 1987, the United States Patent and Trademark Office (PTO) has taken the position that, although more complex organisms than the engineered bacterium at issue in *Chakrabarty*—such as transgenic cows, goats, and pigs—are appropriate patentable subject matter, the PTO cannot issue a patent claim that covers a human being. See Janice M. Mueller, *Patent Law* 279–80 (3d ed. 2009) (discussing post-*Chakrabarty* developments).

4 See generally Diehr, 450 U.S. at 182–84 & n.7 (discussing the longstanding patentability of industrial processes).

5 Id. at 185 (collecting cases).

6 130 S. Ct. 3218 (2010).

7 409 U.S. 63 (1972).

8 437 U.S. 584 (1978).

its patent-maximizing “useful, concrete, and tangible result” standard,\(^\text{10}\) has come to an end, it is time to revisit the reasoning and results in a rich trove of cases from the Federal Circuit and its predecessor, the U.S. Court of Customs and Patent Appeals (CCPA).

Bernard Bilski and Rand Warsaw, the named inventors of the application at issue in the *Bilski* case, sought to patent a process for hedging risk in commodities trading. The principal claim recites the hedging method as follows:

A method for managing the consumption risk costs of a commodity sold by a commodity provider at a fixed price comprising the steps of:

(a) initiating a series of transactions between said commodity provider and consumers of said commodity wherein said consumers purchase said commodity at a fixed rate based upon historical averages, said fixed rate corresponding to a risk position of said consumer;

(b) identifying market participants for said commodity having a counter-risk position to said consumers; and

(c) initiating a series of transactions between said commodity provider and said market participants at a second fixed rate such that said series of market participant transactions balances the risk position of said series of consumer transactions\(^\text{11}\)

\(^{10}\) *See* State St. Bank & Trust Co. v. Signature Fin. Group, Inc., 149 F.3d 1368, 1373 (Fed. Cir. 1998) (holding that “the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces ‘a useful, concrete and tangible result’—a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades”); *In re Alappat*, 33 F.3d 1526, 1544 (Fed. Cir. 1994) (en banc) (“This is not a disembodied mathematical concept which may be characterized as an ‘abstract idea,’ but rather a specific machine to produce a useful, concrete, and tangible result.”). Although *Alappat* and *State Street* involved product, not process, claims, the Federal Circuit quickly applied the “useful, concrete, and tangible result” standard to process claims. *See* AT&T Corp. v. Excel Commc’ns, Inc., 172 F.3d 1352, 1358 (Fed. Cir. 1999) (“Because the claimed process applies the Boolean principle to produce a useful, concrete, tangible result without pre-empting other uses of the mathematical principle, on its face the claimed process comfortably falls within the scope of § 101.”).

The front-line patent examiner rejected the claims as beyond the scope of “process” in § 101.\footnote{In re Bilski, 545 F.3d at 950.} The PTO’s Board of Patent Appeals & Interferences, comprising five administrative patent judges, affirmed.\footnote{Ex parte Bilski, No. 2002-2257, 2006 WL 5738364 (B.P.A.I. Sept. 26, 2006).} The en banc Federal Circuit, in turn, affirmed, 11 to 1; Judge Newman, alone, thought the claims passed muster under § 101.\footnote{Chief Judge Michel, writing for himself and eight others, concluded that the claims constituted unpatentable subject matter. In re Bilski, 545 F.3d at 949. Judges Mayer and Rader agreed with that outcome, although each dissented separately from the majority’s framework and reasoning. Id. at 998 (Mayer, J., dissenting); id. at 1011 (Rader, J., dissenting). Judge Newman disagreed on all counts. Id. at 976.} The Supreme Court affirmed again, 9 to 0, in a set of three opinions.\footnote{Bilski v. Kappos, 130 S. Ct. 3218, 3231 (2010).} In other words, of the 21 federal judges to consider the question, 20 agreed that Bilski’s claims fall outside the scope of “process” in § 101. At the same time, those 20 have disagreed mightily over the proper framework for explaining this result and analyzing future cases.

The Federal Circuit majority began with the indisputable fact that “the Supreme Court has held that the meaning of ‘process’ as used in § 101 is narrower than its ordinary meaning. . . . Specifically, the Court has held that a claim is not a patent-eligible ‘process’ if it claims ‘laws of nature, natural phenomena, [or] abstract ideas.’”\footnote{In re Bilski, 545 F.3d at 952 (alteration in original) (citation omitted) (quoting Diehr v. Diehr, 450 U.S. 175, 185 (1981)).} The majority then canvassed the Supreme Court’s decisions in Diehr, Benson, and Flook to distill from them a standard by which to determine whether the claimed risk-hedging process at issue is or is not an unpatentable abstract idea.\footnote{Id. at 952–58.} It dubbed the standard “the machine-or-transformation test,” describing it as “the tool used to determine whether a claim is drawn to a statutory ‘process’” and “the governing test for determining patent eligibility of a process under § 101.”\footnote{Id. at 956 n.11.} Under this test, “[a] claimed process is surely 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.”\footnote{Id. at 956. See also id. at 964 (stating that “the machine-or-transformation test is the only applicable test and must be applied . . . when evaluating the patent-eligibility of process claims”).} This test has two important companion principles, also derived from Benson and Flook: “First, . . . the use of a specific machine or transformation of an article must impose meaningful limits on the claim’s scope to impart patent-eligibility. Second, the involvement of the machine or transformation in the claimed process must not merely be in-
significant extra-solution activity.” Bilski’s claims flunked the machine-or-transformation test. They neither “limit[ed] any process step to any specific machine or apparatus” nor “transform[ed] any article to a different state or thing.” Rearranging business relationships is insufficient: “Purported transformations or manipulations simply of public or private legal obligations or relationships, business risks, or other such abstractions cannot meet the test because they are not physical objects or substances, and they are not representative of physical objects or substances.”

For the Federal Circuit majority, then, the machine-or-transformation test was a critical step in operationalizing the Supreme Court’s longstanding injunction against permitting the patenting of abstract ideas.

Judge Mayer, for his part, would have rejected Bilski’s claims on the alternative ground that business methods are simply not § 101 “process[es]”: “Affording patent protection to business methods lacks constitutional and statutory support, serves to hinder rather than promote innovation and usurps that which rightfully belongs in the public domain.” Justice Stevens, on review, reached the same conclusion in his concurrence for four of the Justices. Judge Rader, by contrast, rejected both the majority’s machine-or-transformation test and Judge Mayer’s categorical exclusion for business methods. Instead, he concluded, simply, that the risk-hedging claims were fatally abstract and thus outside the reach of § 101: “This court labors for page after page . . . to say what could have been said in a single sentence: ‘Because Bilski claims merely an abstract idea, this court affirms the Board’s rejection.’”

It is to the Supreme Court’s opinions in the case that I now turn.

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21 Id. at 961–62 (citation omitted).
22 Id. at 962.
23 Id. at 963.
24 Id.
25 Id. at 998 (Mayer, J., dissenting). Judge Mayer, frankly, ought to have labeled his opinion a concurrence in the judgment, for he agrees with the majority that the claims are unpatentable. Id. at 1011.
27 In re Bilski, 545 F.3d at 1011 (Rader, J., concurring). Judge Rader, too, ought to have labeled his opinion a concurrence in the judgment, for he also agrees with the majority that the claims are unpatentable. Id. at 1013.
28 Bilski, 130 S. Ct. at 3229–30. Two portions of Justice Kennedy’s opinion—Parts II-B-2 and II-C-2—represent only a plurality of the Court, given that Justice Scalia did not joint these portions. See id. at 3223 n.9 (“Justice Scalia does not join Parts II-B-2 and II-C-2.”).
Justice Kennedy, like Chief Judge Michel, began his elaboration of § 101’s terse collection of broad categories by acknowledging that “[t]he Court’s precedents provide three specific exceptions to § 101’s broad patent-eligibility principles: ‘laws of nature, physical phenomena, and abstract ideas.’”

Although the exceptions are not reflected in § 101’s text, they “have defined the reach of the statute as a matter of statutory stare decisis going back 150 years.” Justice Kennedy then took a bit of a turn, reframing the machine-or-transformation test from the way of assessing an idea’s abstractness (or not) to an additional extra-textual categorical exclusion. Admonishing that it “has ‘more than once cautioned that courts “should not read into the patent laws limitations and conditions which the legislature has not expressed,’” the Court then concluded that “[a]dopting the machine-or-transformation test as the sole test for what constitutes a ‘process’ (as opposed to just an important and useful clue) violates the[ ] statutory interpretation principles” that focus on “the text and the statute’s purpose and design.”

The Court thus demoted the Federal Circuit’s criterion from an exclusive test to “a useful and important clue, an investigative tool, for determining whether some claimed inventions are processes under § 101.” It also rejected a categorical exclusion against business methods, and for the same reason, i.e., an unwillingness to expand the list of extra-textual exclusions beyond the three already established (laws of nature, natural phenomena, and abstract ideas).

Justice Kennedy, having rejected these two additional categorical exclusions, returned to the longstanding categorical exclusion of abstract ideas and the Court’s decisions in Benson and Flook. According to the Court, Bilski’s “claims are not patentable processes because they are attempts to patent abstract ideas.”

Recapping the facts and analyses in Benson and Flook, as well as Diehr, Justice Kennedy laid the predicate for a common-law-style, pattern-matching analysis:

In light of these precedents, it is clear that petitioners’ application is not a patentable “process.” Claims 1 and 4 in petitioners’ application explain the basic concept of hedging, or protecting against risk: “Hedging is a fundamental economic practice long prevalent in our system of commerce and taught in any introductory finance class.” The concept of hedging, described in claim 1 and

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29 Id. at 3225 (quoting Diamond v. Chakrabarty, 447 U.S. 303, 309 (1980)).
30 Id.
31 Id. at 3226 (quoting Diamond v. Diehr, 450 U.S. 175, 182 (1981)).
32 Id.
33 Id. at 3227. Justice Stevens called it “an important test for patentability.” Id. at 3235 (Stevens, J., concurring in the judgment). Justice Breyer agreed it is “a useful and important clue” and “an important example of how a court can determine patentability under § 101.” Id. at 3258–59 (Breyer, J., concurring in the judgment).
34 Id. at 3228.
35 Id. at 3229–30.
reduced to a mathematical formula in claim 4, is an unpatentable abstract idea, just like the algorithms at issue in Benson and Flook. Allowing petitioners to patent risk hedging would pre-empt use of this approach in all fields, and would effectively grant a monopoly over an abstract idea.

Petitioners’ remaining claims are broad examples of how hedging can be used in commodities and energy markets. Flook established that limiting an abstract idea to one field of use or adding token postsolution components did not make the concept patentable. That is exactly what the remaining claims in petitioners’ application do. These claims attempt to patent the use of the abstract idea of hedging risk in the energy market and then instruct the use of well-known random analysis techniques to help establish some of the inputs into the equation. Indeed, these claims add even less to the underlying abstract principle than the invention in Flook did, for the Flook invention was at least directed to the narrower domain of signaling dangers in operating a catalytic converter.36

The Bilski majority’s rationale, albeit more a gesture than an analysis, marks a strong reaffirmation of Benson and Flook, two cases that many had thought Diehr largely superseded.37

Justice Stevens, concurring in the judgment, offered an extensive historical review of the patentability of business methods. He concluded that, “although a process is not patent-ineligible simply because it is useful for conducting business, a claim that merely describes a method of doing business does not qualify as a ‘process’ under § 101.”38 Indeed, according to Justice Stevens, “the history of our patent law . . . strongly supports the conclusion that a method of doing business is not a ‘process’ under § 101.” His view, however, attracted only three other Justices.

Finally, Justice Breyer, writing for himself and Justice Scalia, wrote “to highlight the substantial agreement among many Members of the Court on many of the fundamental issues of patent law raised by this
Reflecting a member of the majority and a member of the plurality, this separate concurrence bridges those other efforts. Justice Breyer raised “four points [that] are consistent with both the opinion of the Court and Justice Stevens’ opinion,” as follows:

- “First, although the text of § 101 is broad, it is not without limit.” It does not extend to laws of nature, natural phenomena, or abstract ideas.
- “Second, in a series of cases that extend back over a century, the Court has stated that ‘[t]ransformation and reduction of an article to a different state or thing is the clue to the patentability of a process claim that does not include particular machines.’”
- “Third, while the machine-or-transformation test has always been a ‘useful and important clue,’ it has never been the ‘sole test’ for determining patentability.”
- “Fourth, although the machine-or-transformation test is not the only test for patentability, this by no means indicates that anything which produces a ‘useful, concrete, and tangible result’ is patentable.”

Where, then, is the law of patentable subject matter for processes headed? The PTO has already issued interim guidance to help examiners hew to the Supreme Court’s Bilski decision. Meanwhile, the Federal Circuit undoubtedly has before it many cases, on appeal from both PTO rejections and district court invalidity judgments, that permit it to work out the boundaries of § 101 with the benefit of the Supreme Court’s reaffirmation of Benson and Flook. Indeed, the Supreme Court itself is responsible for two such cases, vacating and remanding to the Federal Circuit two patentable-subject-matter cases—Prometheus and Classen—for further consideration in light of Bilski.

Amid all the opinions across both courts, one vital point emerges clearly: The Federal Circuit, en banc, has disavowed its Alappat/State Street misadventure, according to which all a process need do, to pass muster under § 101, is yield a useful, concrete, and tangible result. The Su-
preme Court’s comments about State Street in Bilski range from polite—and, one imagines, slightly embarrassed—indifference to outright hostility. In short, the Alappat/State Street standard is dead. The pre-Alappat cases analyzing process claims under § 101, especially in the period from just before Benson to just before Alappat, thus take on greater importance as exemplars of sounder reasoning and results on both sides of the § 101 boundary. I have identified 27 such cases, and the Appendix to this Essay lists them. These older cases, like Benson and Flook, are new again. They will reward renewed attention.

On this point, at least, Judge Mayer agreed with the majority, for he was willing to take a further step: “State Street and AT&T should be overruled.” Id. at 998 (Mayer, J., dissenting).

Bilski, 130 S. Ct. at 3231 (“And nothing in today’s opinion should be read as endorsing interpretations of § 101 that the Court of Appeals for the Federal Circuit has used in the past. See, e.g., State Street [and] AT&T Corp.” (citations omitted)).

Id. at 3232 n.1 (Stevens, J., concurring in the judgment) (stating that “it would be a grave mistake to assume that anything with a ‘useful, concrete and tangible result’ may be patented” (quoting State St. Bank & Trust Co. v. Signature Fin. Group, Inc., 149 F.3d 1368, 1373 (Fed. Cir. 1998))); id. at 3259 (Breyer, J., concurring in the judgment) (“Indeed, the introduction of the ‘useful, concrete, and tangible result’ approach to patentability, associated with the Federal Circuit’s State Street decision, preceded the granting of patents that ‘ranged from the somewhat ridiculous to the truly absurd.’ In re Bilski, 545 F.3d 943, 1004 (Fed. Cir. 2008) (Mayer, J., dissenting) (citing patents on, inter alia, a ‘method of training janitors to dust and vacuum using video displays,’ a ‘system for toilet reservations,’ and a ‘method of using color-coded bracelets to designate dating status in order to limit “the embarrassment of rejection”’). To the extent that the Federal Circuit’s decision in this case rejected that approach, nothing in today’s decision should be taken as disapproving of that determination.” (internal citation omitted)).
APPENDIX

Below is a chronological list of the major CCPA and Federal Circuit cases, spanning the years 1969 to 1994, adjudicating whether a process sought to be claimed constitutes patentable subject matter under 35 U.S.C. § 101. A “+” symbol indicates that the court held the claim(s) in the case patentable, whereas a “–” symbol indicates that the court held the claim(s) unpatentable. The symbol “+/–” indicates a mixed result.

+ \textit{In re} Bernhart, 417 F.2d 1395 (C.C.P.A. 1969)
+ \textit{In re} Musgrave, 431 F.2d 882 (C.C.P.A. 1970)
+ \textit{In re} Foster, 438 F.2d 1011 (C.C.P.A. 1971)
+ \textit{In re} Benson, 441 F.2d 682 (C.C.P.A. 1971), rev’d, 409 U.S. 63 (1972)
– \textit{In re} Christensen, 478 F.2d 1392 (C.C.P.A. 1973)
+ \textit{In re} Chatfield, 545 F.2d 152 (C.C.P.A. 1976)
+ \textit{In re} Deutsch, 553 F.2d 689 (C.C.P.A. 1977)
– \textit{In re} Waldbaum, 559 F.2d 611 (C.C.P.A. 1977)
– \textit{In re} Richman, 563 F.2d 1026 (C.C.P.A. 1977)
+ \textit{In re} Freeman, 573 F.2d 1237 (C.C.P.A. 1978)
+ \textit{In re} Toma, 575 F.2d 872 (C.C.P.A. 1978)
– \textit{In re} Sarkar, 588 F.2d 1330 (C.C.P.A. 1978)
+ \textit{In re} Johnson, 589 F.2d 1070 (C.C.P.A. 1979)
– \textit{In re} Gelnovatch, 595 F.2d 32 (C.C.P.A. 1979)
+ \textit{In re} Bradley, 600 F.2d 807 (C.C.P.A. 1979)
– \textit{In re} Maucorps, 609 F.2d 481 (C.C.P.A. 1979)
– \textit{In re} Walter, 618 F.2d 758 (C.C.P.A. 1980)
+ \textit{In re} Taner, 681 F.2d 787 (C.C.P.A. 1982)
+\textendash\textit{In re} Abele, 684 F.2d 902 (C.C.P.A. 1982)
+ \textit{In re} Pardo, 684 F.2d 912 (C.C.P.A. 1982)
– \textit{In re} Meyer, 688 F.2d 789 (C.C.P.A. 1982)
– \textit{In re} Grams, 888 F.2d 835 (Fed. Cir. 1989)
+ \textit{In re} Iwahashi, 888 F.2d 1370 (Fed. Cir. 1989)
+ \textit{Arrhythmia Research Tech., Inc. v. Corazonix Corp.}, 958 F.2d 1053 (Fed. Cir. 1992).
– \textit{In re} Schrader, 22 F.3d 290 (Fed. Cir. 1994)
– \textit{In re} Warmerdam, 33 F.3d 1354 (Fed. Cir. 1994)