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Temperamental or Transient as a Tesseract? Analyzing Process Patent Eligibility Post-Alice

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TEMPERAMENTAL OR TRANSIENT AS A TESSERACT? ANALYZING PROCESS PATENT ELIGIBILITY POST-*ALICE*

Dr. Johanna K. P. Dennis*

In holding that the machine or transformation test was not the only way for processes to satisfy section 101 of the Patent Act, *Bilski v. Kappos* seemed to signal the potential for a broadening of patent eligible subject matter to the outer limits of abstraction. Since *Bilski*, in fact, we have seen a narrowing of what constitutes patent eligible subject matter via the *Mayo/Alice* test as it relates to computer technologies, business methods, and medical diagnostics, while the boundaries continue to remain unclear. This paper analyzes the landscape of section 101 eligibility through the post-*Alice* landscape by discussing the trajectory and evolution of process patents, assessing the prudence of recent attempts to deflect that path, and making recommendations for navigating a seemingly abstract arena.

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I. INTRODUCTION

The right to exclude others from using one’s creative output is at the base of intellectual property law. Some of the primary ways that companies fund research and development are through growing and attributing value to their intellectual property portfolios, made up of clusters of rights to exclude others from using or licensing others to use parts and the whole of an

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innovation.¹ Particularly, in patent law, the monopoly obtained tends to be even more valuable than in trademark and copyright² contexts because the thing monopolized is the product of intellectual curiosity, research, and advancement.³ In trademark, we protect the mark, logo, or brand itself from use or dilution by others.⁴ The mark's value lies in the strength of the reputation of that with which it is affiliated. It has no other commercial value. Similarly, in copyright, we protect the memorialization of an author's thoughts and musings at a fixed point in time, as demonstrated in their "original artistic and literary works."⁵ In addition, copyright provides a restriction on the right to make subsequent derivative works from the copyrighted work. The value in copyright is not in the actual words on the pages, so as to prevent another from using those words or ideas to create other unrelated works. Nor is the value in trademark such that it prevents use of any and all of the independent parts of the mark in subsequent unrelated marks. However, patent rights do exactly this—protect an invention⁶ by preventing others from using not simply the preferred embodiment of the whole, but any part of the patented invention, fully described in the patent. The ability to prevent another from using the idea described in one claim is vastly more powerful than most any power conceivable in either trademark or copyright. Thus, while in copyright we protect the tangible creation, and in trademark we protect the design of the creation, in patent we protect the ideas that give rise to the creation.

But, this concept of protecting ideas is a formidable opponent. Ideas, thoughts, visualizations of steps and parts coming together are all intangible and abstract concepts. A patent need not be actually reduced to practice—that is, actually “built,” “done,” or “used” in the tangible world—for it to be

¹ See generally Thomas Gering, *The Role of Intellectual Property (IP) in R&D-Based Companies: Setting the Context of the Relative Importance and Management of IP*, EUR. COMM'N DIRECTORATE-GEN. JOINT RES. CTR. (Apr. 30, 2004), https://www.wipo.int/edocs/mdocs/sme/en/wipo_iasp_ge_04/wipo_iasp_ge_04_8.pdf (discussing use of IP licenses to generate revenue); Masoud Vakili, *Patent Portfolio Valuations-Importance of IP and Patents*, IPWATCHDOG (July 12, 2017), <https://www.ipwatchdog.com/2017/07/12/patent-portfolio-valuations/id=85409/> (“Intellectual Property (IP) is a crucial portion of a company's assets. Today, a great portion of the assets of Fortune 500 companies consists of intangible assets including intellectual property.”).

² See Vakili, *supra* note 1 (“Patents are in many cases the most important portion, especially in the high tech and biotech industries.”).

³ “Ideas” are arguably more valuable than tangible things that can be built with them, for one can use an idea to seed any number of final embodiments and even more ideas. Therefore, excluding others from using an “idea” is a substantial barrier to that individual's ability to compete in the same business market.

⁴ USPTO, PROTECTING YOUR TRADEMARK: ENHANCING YOUR RIGHTS THROUGH FEDERAL REGISTRATION 2 (2019).

⁵ *Id.*

⁶ *Id.*

protectable.⁷ Further, as we venture deeper into the twenty-first century, some of the types of innovations with great potential are also capable of posing great obstacles to future innovation.

II. DEFINING PATENT ELIGIBILITY

Globally, the concept of granting patent monopolies to inventors for their innovations has required a showing of novelty, utility, and non-obviousness (inventive step), notwithstanding how these terms have been couched.⁸ These three pillars are indisputably the hallmarks of innovation, yet different sovereigns have interpreted the same terms and concepts in different ways.⁹ Of the three, the determination of what is sufficient to constitute the requisite inventive step has been the most turbulent, generating more confusion and less predictability than could have been foretold.

It would tend to seem straightforward that if someone develops a new way of solving an existing problem in society, that process would be worthy of patent. Generally, if this process had not previously been identified in relation to the problem, then it would be new, so as to satisfy the novelty requirement.¹⁰ Assessments of novelty generally involve addressing whether the claimed invention was truly discovered or merely identified from pre-existing contexts, through comparisons with what is already known to what is claimed in the invention.¹¹ As to utility, with the exception of innovations treading areas and concepts that particular sovereigns deem requiring a balancing of interests,¹² or an assessment of usefulness as a patented product

⁷ 2138.05 PRE-AIA 35 U.S.C. 102(g), USPTO (2019), <https://www.uspto.gov/web/offices/pac/mpep/s2138.html#d0e207753>.

⁸ See *Patents*, WIPO, <https://www.wipo.int/patents/en/> (last visited Apr. 16, 2020); World Intellectual Property Organization [WIPO], *Exclusions from Patentable Subject Matter and Exceptions and Limitations to the Rights*, at 2, SCP/13/3 (Feb. 4, 2009), https://www.wipo.int/edocs/mdocs/scp/en/scp_13/scp_13_3.pdf (“[O]nly those [inventions] that meet the three patentability criteria, i.e., novelty, inventive-step (non-obviousness) and industrial applicability (utility) are entitled to patent protection so that only the inventions that contribute to technical progress are rewarded.”).

⁹ See, e.g., World Intellectual Property Organization [WIPO], *Exclusions from Patentable Subject Matter and Exceptions and Limitations to the Rights*, at 6–8, SCP/13/3 (Feb. 4, 2009), https://www.wipo.int/edocs/mdocs/scp/en/scp_13/scp_13_3.pdf.

¹⁰ See e.g., Jose Luis Reyes Villamizar, *WIPO Sub-Regional Workshop on Patent Policy and Its Legislative Implementation*, WIPO (2013), https://www.wipo.int/edocs/mdocs/patent_policy/en/wipo_ip_skb_13/wipo_ip_skb_13_t10.pdf (slide on novelty).

¹¹ 35 U.S.C. § 102 (2015).

¹² *Bioethics and Patent Law: The Case of the OncoMouse*, WIPO MAG. (June 2006), https://www.wipo.int/wipo_magazine/en/2006/03/article_0006.html [hereinafter *Case of the OncoMouse*]; Dennis Borges Barbosa & Karin Grau-Kuntz, World Intellectual Property Organization

as compared to usefulness in solving a problem, this is not often a high hurdle for the inventor to traverse. Third, inventors need to demonstrate that what they have claimed contains an inventive step and thus would not be obvious to someone in the field.¹³ Of these three, non-obviousness and novelty have been more perplexing when it comes to methods and processes.

In other areas of law based in statutes when seeking a definition or guidance, interpreters turn to the statute itself, other contexts with similar structures, legislative intent, and then prior precedent. As to novelty, the statute itself provides some guidance, by indicating that the “prior art” (the body of technological knowledge known and available) should be considered.¹⁴ However, determining just how much is “already known” and what types of things “already known” can defeat a claim to novelty have underpinned the issue of patent eligibility. Similarly, as to non-obviousness, here the focus is on the differences between what is already known and the claimed invention to determine whether those differences are sufficient to render the content not obvious.¹⁵ On this score, case law runs far and wide, and several major hallmarks have transformed much of patent prosecution for methods and processes into a patent eligibility pursuit. The basic premises are that all patentable processes must be new—else the very meaning of “invent” is thrown askew, that all patentable processes must have a purpose or solve some identified problem, and that all patentable processes should advance the field by adding something more than what is already known to be there. What is an inventor if not someone who creates and contributes to their field?

Arguably, the patent monopoly system does not seek to reward individuals for mere stenography or observation of existing biological or chemical processes. Nor does it seek to compensate for mathematical derivations, formulas, or algorithms, which form the computational basis of technological and physical arts. Both of these groups of processes are those which involve nothing more than asserting that which already exists, occurs, or results independent of the inventor. Thus, the universe of patentable matter includes “anything under the sun that is made by man,”¹⁶ limited by the caveat that the subject matter must also be eligible for patent. The determination of what is eligible and what is not has come down to an inclusion or exclusion analysis.¹⁷ Over time, the United States Supreme Court

[WIPO], *Exclusions from Patentable Subject Matter and Exceptions and Limitations to the Rights - Biotechnology*, SCP/15/3, Annex III, at 30–35 (Jan. 1, 2010).

¹³ 35 U.S.C. § 103 (2015).

¹⁴ *Id.* § 102.

¹⁵ *Id.* § 103.

¹⁶ *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980).

¹⁷ See Dennis Borges Barbosa & Karin Grau-Kuntz, *supra* note 12, at 6.

has determined that abstract ideas, mathematical formulas or algorithms, and laws of nature are not eligible for patent,¹⁸ while anything falling outside those categories is indeed eligible.

As technology develops and we create methods of doing things more efficiently, more reliably, and more consistently, are those methods also not “new” simply because the same steps involve abstract ideas and could be done less efficiently, unreliably, and with variable results without the aid of the technological advancement? Are they not “new” because they involve calculations, and humankind has known about systems of numbers for thousands of years? *What* then serves as the spark to encourage individuals to innovate, if they will be faced with claims that their “creations” are simply “fancy,” yet routine abstract ideas? In some technological areas, the innovation is intentionally intangible and purposefully abstract, deliberately so because the intention is to replace human mental processes.¹⁹ These types of innovations, many of which involve artificial intelligence (“AI”), incur substantial costs to innovate,²⁰ but in light of the judicial exceptions to patent eligibility, there remains the question as to whether there is any patent monopoly to be gained from AI innovations.

III. “YOU DON’T OWN ME”

There is no debate about ownership of the sun, the moon, and the stars. No one person or entity owns the naturally occurring cycles that give us rain, sleet, snow, or hail. These are owned by no one and all of us the same. This premise justifies the three judicial exceptions discussed herein, all of which relate to aspects which it is presumed are not capable of ownership. In economics, that scarcity makes a commodity more valuable is not an idea that one can prevent others from using to fix their prices based on data about resource availability. Similarly, in biology, notwithstanding the countless hours Mendel put into crossing pea plants, he would not have been able to prevent anyone from doing the same crosses to produce their own peas.

This author previously argued that foundational research should not be patent eligible subject matter, on the basis of balancing usefulness as a patented invention against potential usefulness to the public at a reasonable

¹⁸ *Diamond v. Diehr*, 450 U.S. 175, 185–86 (1981).

¹⁹ See *Artificial Intelligence – What Is and Why It Matters*, SAS, https://www.sas.com/en_us/insights/analytics/what-is-artificial-intelligence.html (last visited Mar. 29, 2020).

²⁰ See, e.g., Nelson Cicchitto, *What Is the Cost of Implementing AI Today?*, AVATIER (May 9, 2019), <https://www.avatier.com/blog/what-is-the-cost-of-implementing-ai-today/>; *SAS Announces \$1 Billion Investment in Artificial Intelligence (AI)*, SAS (Mar. 17, 2019), https://www.sas.com/en_us/news/press-releases/2019/march/artificial-intelligence-investment.html.

cost, and on the basis of promoting further innovation through unfettered access to the building blocks of innovation.²¹ In terms of industrial-era machines, articles of manufacture, processes, and compositions of matter, the determination of where lay the pillars of research, such as to be excluded from patent protection, was generally a straightforward concept to apply. For example, it was commonly known and undisputed that the naturally occurring elements in the periodic table, which form the basis of all compositions of matter, are not patent-eligible subject matter because they are found in nature and are not “created” by humans. By contrast, depending on the jurisdiction, synthetic elements may be able to obtain patent protection²² and are patent-eligible subject matter. Similarly understood as beyond patent-eligible subject matter were raw mathematical formulas, algorithms, and laws of nature, which merely described series of steps that existed entirely independent of human intervention.

In the context of the modern biotechnological era, these concepts were turned on their heads as researchers began creating transgenic “life” and finding ways to pre-diagnose through genetics. Referring to the Harvard OncoMouse,²³ perhaps the most famous of the first transgenic animals,²⁴ this author previously asserted that any alleged “article of manufacture” or “composition matter” that existed through the natural execution of biological development was not “invented,” “created,” or “made” by mankind and constituted foundational research. Notwithstanding human involvement in integrating a recombinant activated oncogene sequence that triggered tumor growth into both germ and somatic cells of the mouse, it was not through human involvement that either mitosis or meiosis occurred growing the cells to become the stereotypical white lab mouse. These scientists should have been no more able to monopolize the mouse that developed independently than they could grass and weeds. Furthermore, as borne out in the range of

²¹ See Johanna K.P. Dennis, *Divergence in Patent Systems: A Discussion of Biotechnology Transgenic Animal Patentability and U.S. Patent System Reform*, 1 INT’L J. PRIV. L. 268, 268–303 (2008).

²² See *Element Patented for the First Time*, N.Y. TIMES (Nov. 14, 1964), <https://www.nytimes.com/1964/11/14/archives/element-patented-for-the-first-time.html> (US patents to Americium-95 and Curium-96); Zack Mummery, *International Year of the Periodic Table – Can a Chemical Element Be Patented?*, REDDIE & GROSS (June 27, 2019), <https://www.reddie.co.uk/2019/06/27/international-year-of-the-periodic-table-can-a-chemical-element-be-patented/> (“A newly synthesised chemical element would not be excluded from patentability for being a discovery, at least in the UK and before the European Patent Office (EPO), because the new element would have been synthesised.”).

²³ *Case of the OncoMouse*, *supra* note 12.

²⁴ See, e.g., Jerry Adler, *The First Patented Animal Is Still Leading the Way on Cancer Research*, SMITHSONIAN MAG. (Dec. 2016), <https://www.smithsonianmag.com/smithsonian-institution/first-patented-animal-still-leading-way-cancer-research-180961149/>.

litigation about whether the mouse could be patent eligible,²⁵ it was questionable for the U.S. to have allowed an application for patent²⁶ to pass through the gates of patent eligibility when the “article of manufacture” sought to be patented was a living being—but for the gene, it was like all other beings of its kind—all themselves “articles found in nature” and not manufactured at all.²⁷ Oncology, which focuses heavily on determining what treatments are effective on tumor cells, stood to benefit from a living test subject, upon whom treatments could be administered and effects measured by way of clinical trial as opposed to the limited scope of laboratory *in vitro* studies.²⁸ Accordingly, a patent to the basis of that research would necessarily transform the laws of nature, here development of mammal germ and somatic cells into a being, from patent-ineligible to patent-eligible subject matter. In this sense, biotechnology and genetically engineered end-products, which themselves created a new “floor” and basis for research in medicine, pharmacology, and beyond, should have been viewed the same as other foundational patent-ineligible subject matter.²⁹

A quarter of a century after the Harvard OncoMouse was patented in the US, the patent eligibility issue came full circle when the US Supreme Court recognized that the core foundation of genetic research is naturally occurring genes and DNA sequences which are not patent-eligible subject matter, while synthetically or human-created sequences could be patented.³⁰ One could make the case that because the OncoMouse only grew into a creature through naturally occurring biological processes, it remained a mouse and thus patent-ineligible subject matter.

There is also a key difference between foundational “articles” used in research, such as genes on the micro-level, and “mice” on the macro-level and the manner in which lab researchers introduced chemicals and cells to

²⁵ The Harvard OncoMouse was patented in the U.S. (US Pat. No. 4,736,866) in an application referencing non-human mammals. It was eventually allowed by the European Patent Office after a lengthy inquiry and amendment of the application limited to transgenic mice. *See, e.g.*, T 0019/90 (Onco-Mouse) of 3.10.1990, EUR. PAT. OFF., <https://www.epo.org/law-practice/case-law/appeals/recent/t900019ep1.html> (last visited Apr. 16, 2020). Meanwhile, the Canadian patent office rejected the OncoMouse patent application on the basis that “higher life forms were not patentable.” *Harvard College v. Canada* (Commissioner of Patents), [2002] S.C.R. 45 (Can.).

²⁶ The first patent to the OncoMouse was granted in 1988 in the United States. U.S. Pat. No. 4,736,866.

²⁷ *See Harvard College v. Canada* (Commissioner of Patents), [2002] 4 S.C.R. 45 (Can.) (stating that the OncoMouse was not an article of manufacture).

²⁸ *See also Case of the OncoMouse*, *supra* note 12 (EPO’s analysis “concluded that the usefulness of the OncoMouse in furthering cancer research satisfied the likelihood of substantial medical benefit, and outweighed moral concerns about suffering caused to the animal.”).

²⁹ *See Dennis*, *supra* note 21, at 286.

³⁰ *See Ass’n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 580 (2013).

create these “articles.”³¹ While the naturally occurring genes and mice are foundational to developing therapies and treatments, a strong argument may be made that the specific analyses and trials conducted to either stimulate or suppress cell development should be both patentable and patent eligible as these methods and processes are the products of not only researchers’ scientific knowledge and resources, but their creativity and imaginations.³² Of similar less-disputed genre are the resulting medicines—compositions of matter—derived from the processes themselves. However, the current state of the law pertaining to patent eligibility has operated to invalidate some innovations and draw into question others in the realm of what a mere decade ago would have been accepted as protectable research innovations and creative business methods.³³ An analysis of how our system has come to this point and where we are headed is warranted.

IV. BACKGROUND ON PATENT ELIGIBILITY

Over the history of patent law, no one statute has caused so much consternation as has 35 U.S.C. § 101, which provides: “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.”³⁴ Section 101 of the Patent Act was intended to be broad in scope³⁵ to allow for a large range of potential innovations. In listing the four categories within it, the statute does not guarantee that all and every such “composition of matter” and such will be patent eligible. The provision only provides a basis that these are the classifications of patentable innovations. To pass the gauntlet into the

³¹ See Dennis, *supra* note 21, at 279; *Myriad*, 569 U.S. at 577.

³² See also *Myriad*, 569 U.S. at 596, 595 (There were no method patents at issue in this case, nor did the case involve “patents on new applications of knowledge about the BRCA1 and BRCA2 genes.” The Court noted that “[h]ad Myriad created an innovative method of manipulating genes while searching for the BRCA1 and BRCA2 genes, it could possibly have sought a method patent.”).

³³ See Robert P. Greenspoon, *Congress’ Section 101 Fix Would Create a 112(f) Problem*, IPWATCHDOG (May 28, 2019), <https://www.ipwatchdog.com/2019/05/28/congress-section-101-fix-create-112f-problem/id=109766/> (The Courts recent rulings “catastrophically undermine[] and invalidate[] important patents that, until then, protected breakthrough inventions.”).

³⁴ 35 U.S.C. § 101 (2020).

³⁵ See Daniel T. Taskalos, *Returning to the Status Quo?—Proposed Outline for Section 101 Reform*, NAT’L L. REV. (Apr. 22, 2019), <https://www.natlawreview.com/article/returning-to-status-quo-proposed-outline-section-101-reform> (“Section 101 only recites broad categories of patent-eligible subject matter.”); CONGRESSIONAL RESEARCH SERVICE, PATENT-ELIGIBLE SUBJECT MATTER REFORM IN THE 116TH CONGRESS (Sep. 17, 2019), <https://fas.org/sgp/crs/misc/R45918.pdf>; see also 2111 *Claim Interpretation; Broadest Reasonable Interpretation*, USPTO (2018), <https://www.uspto.gov/web/offices/pac/mppep/s2111.html> (During patent examination, the pending claims must be “given their broadest reasonable interpretation consistent with the specification.”).

patent monopoly, the innovation must also be eligible for patent as based on the existing legal system.

Section 101 was relatively untouched for much of the over 200-year history of the Patent Act. Over the past 47 years, the Supreme Court has reshaped the image of patent eligibility for processes and business methods, starting in 1972 with *Benson*.

In *Gottschalk v. Benson*,³⁶ in discussing a patent involving a mathematical formula in conjunction with a digital computer, the Supreme Court held that since the formula had no practical application outside of the computer, i.e., served no purpose except when integrated or run on a digital computer, allowing a patent to the computer using the formula would be in fact a patent to the formula itself. This kind of patent would be stifling to research, as allowing one inventor to hold control over the computer-formula combination would mean all others would not be able to develop any technology deriving from the formula either since they could not do so without using a computer.

Then, six years later, in *Parker v. Flook*,³⁷ the Court again addressed formulas and determined that claims in a patent were not patent eligible nor patentable on the basis of being “methods of calculating” a solution to a problem. Of significance here was the Court’s statement that in evaluating these claims, it would proceed as if the principle or formula were well-known. This essentially rendered every conceivable algorithm, whether or not actually conceived, part of the “well-known” foundational concepts that the Court views as patent ineligible.

Three years later in *Diehr*,³⁸ the Court provided some hope by its statement that “applications” and newly discovered methods of measurement were not the same as concepts themselves.

Even so, at the end of this body of cases, we had solidified the judicially created exceptions to patent eligibility as being laws of nature, natural phenomena, and abstract ideas.

As such, it has come to be known that the official position is that section 101 has carried with it an “implicit exception” to what may be patented; laws of nature, natural phenomena, and abstract ideas have never been patentable.³⁹ It should be noted there is nothing written into section 101

³⁶ *Gottschalk v. Benson*, 409 U.S. 63, 72 (1972).

³⁷ *Parker v. Flook*, 437 U.S. 584, 595 (1978).

³⁸ *Diamond v. Diehr*, 450 U.S. 175, 211 (1981).

³⁹ “We have long held that this provision contains an important implicit exception: Laws of nature, natural phenomena, and abstract ideas are not patentable.” *Ass’n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 589 (2013); *see also* *Bilski v. Kappos*, 561 U.S. 593, 601–02 (2010); *O’Reilly v. Morse*, 56 U.S. 62 (1854); *Le Roy v. Tatham*, 55 U.S. 156 (1853).

providing for any limitation at the patent-eligibility threshold—based on “laws of nature, natural phenomena, or abstract ideas” or anything else.

One argument for why these aspects should be excluded is that mankind does not invent that which fundamentally exists outside of his intervention—both of which true laws of nature and natural phenomena do. There then remain abstract ideas, which in the world before artificial intelligence would tend to require the thought by an individual, as an idea was not thought to be something that could exist apart from the human mind.

What remained murky is where an idea surpasses being merely abstract so as to permit patent and the right to exclude all others from its use. On this, patentees, patent practitioners, and Courts have seemed to drift rudderless in search of Treasure Island, with tests eluding and articulating where this line is.⁴⁰ Furthermore, the very purpose of AI is often to replace that which we would do with our own minds. Thus, we train AI machines to recognize inputs, “think,” and produce outputs—and the possibility that all of that work may not provide any monopoly could serve as a disincentive to innovation.⁴¹

V. RECENT TRAJECTORY

A. Refining the Exceptions

Since *Diehr*, the U.S. patent system—from the U.S. Patent and Trademark Office’s guidance documents through to the U.S. Supreme Court’s recent decisions—has strived to “catch up” to technology, while consistently lagging behind it.

Prior to 2010, the test used to determine whether a process was patent eligible had been to evaluate whether the innovation produced a “useful, concrete, and tangible result.”⁴² This result-oriented test articulated by the Federal Circuit in 1998 ruled the roost and provided a predictable means of evaluating how to navigate office actions, until the Court stepped in for the first time since *Diehr*, allegedly to clarify the scope of patent eligible subject matter. What came next threw the door wide open on what types of things could be patent eligible.

⁴⁰ See, e.g., Angelo J. Bufalino & Christopher P. Moreno, *The U.S. Supreme Court’s Ruling in Bilski v. Kappos: Hedging Against Bright-Line Rules*, NAT’L L. REV. (Sep. 4, 2010), <https://www.natlawreview.com/article/us-supreme-court-s-ruling-bilski-v-kappos-hedging-against-bright-line-rules>.

⁴¹ See, e.g., *Myriad*, 569 U.S. at 589 (“[P]atent protection strikes a delicate balance between creating ‘incentives that lead to creation, invention, and discovery’ and ‘imped[ing] the flow of information that might permit, indeed spur, invention.’”).

⁴² See *St. Street Bank & Tr. Co. v. Signature Fin. Grp., Inc.*, 149 F.3d 1368, 1373 (Fed. Cir. 1998).

In *Bilski v. Kappos*, the Office and the courts were faced with a matter involving a business method patent that had disclosed a method for hedging against price-fluctuation risk in the commodity markets.⁴³ Ultimately at all levels, from the PTO through to Federal Circuit and the Supreme Court, the patent was found not to be patent-eligible as it recited a fundamental economic principle.⁴⁴ While invalidating the patent, the Supreme Court restructured the analysis for assessing whether a process or business method was patent eligible. While some patents may fall neatly within either a machine or a transformation, the test the Federal Circuit had adopted for use below,⁴⁵ according to the Court, those were not the only ways that these patents could be patent eligible.⁴⁶ And that was it.

What were the other ways? *Bilski*'s undefined edges practically invited confusion and laid groundwork for the need for the Court to re-explain these boundaries, if any. In a combination of cases shifting the patent eligibility test even further from its roots in *State Street*,⁴⁷ the Court articulated a two-step test that focuses on spotting the "inventiveness" or "creativity" in the patent.

First, in 2012, the Court turned to the third exception "laws of nature" to address patent eligibility in *Mayo v. Prometheus Labs*.⁴⁸ In so doing, it took account of all three of its own preexisting judicial exceptions, which had hitherto focused only on business methods, and the mathematical algorithm and abstract ideas exceptions discussed in their prior cases, to fashion a suitable test for medical diagnostics. One significant aspect of *Mayo* was this extension of the judicial exceptions framework previously applied to business methods, now into medical technologies.

Subsequently, in *Mayo v. Prometheus Laboratories*, the claims read to a method of administering a drug, checking and determining concentration of a metabolite, and then based on that measurement, making a decision as to dosage. The core of that process lay in the biochemical relationship

⁴³ *Bilski*, 561 U.S. at 593.

⁴⁴ *Id.* Further, in *Bilski*, the PTO and CAFC had rejected as unpatentable "a method of determining and balancing risk, such as weather-related risks, in commodities trading." See Johanna K.P. Dennis, *Redux on the "Process" of Patenting and the U.S. Supreme Court's Consideration of Bilski?*, 2010 TEMPLE J. SCI., TECH. & ENVTL L. 1, 1 (2010). Separate from the tests discussed by the Court, some have stated that by all accounts and under any test or analysis the claimed invention was unpatentable. See *id.*; Johanna K.P. Dennis, *The "Process" of Patenting: Why Should We Care About a Potential U.S. Supreme Court Decision in Bilski v. Doll?*, 25 COMPUTER L. & SEC. REV. 543–53 (2009).

⁴⁵ In *Bilski*, the *State Street* test was rejected by CAFC and instead replaced with a two-pronged test—either a machine or a transformation—was required to demonstrate patent eligible subject matter. The Supreme Court affirmed that this was "one test" but not the only test and this became the new normal.

⁴⁶ *Bilski*, 561 U.S. at 593.

⁴⁷ *St. Street Bank & Tr. Co.*, 149 F.3d at 1368.

⁴⁸ *Mayo Collaborative Servs. v. Prometheus Labs.*, 566 U.S. 66, 72 (2012).

between concentration of one thing and the effect it would have on another. In finding the claims patent ineligible, the Court held that these steps—“administering” and “determining”—were not enough to overcome the presumption of patent ineligibility triggered when a claim fell within a judicial exception. We previously knew from *Flook* that claims reading to calculations, and thus measurement, would not survive a challenge on the basis of judicial exception.⁴⁹ Instead of being viewed as a distinct method—and one which may, in fact, have surpassed the *State Street* “useful, concrete and tangible result” test—the claims asserted were rejected as the types of things scientists do in labs on a routine basis, while determining dosage based on the effect of a drug on a patient is routine in the practice of medicine.⁵⁰

While recognizing that to some degree all inventions involve in some way laws of nature, natural phenomena, or abstract ideas, the Court created from whole cloth a two-part test for determining patent eligibility.⁵¹ To engage in the analysis about whether an invention was patent ineligible due to a judicial exception, in what may seem like an obvious first step, but one the Court articulated as necessary, the claims must focus (individually or collectively) on either a law of nature, natural phenomenon, or an abstract idea. If a judicial exception is triggered, then the analysis turns to being able to identify and isolate what aspect above and beyond the exception is present in the claims.⁵² This step-two search, also known as the search for the inventive step, has been the bane of many a patent practitioner. “What is an inventive step? What does it look like and how do we articulate it?”

By this point, hope for a clear framework for business method patent eligibility was but a pipe dream, given that the new framework articulated in *Mayo*’s “show me the more,” was even more obscure than *Bilski*’s “and other ways.” It seemed that the Court was shifting away from a test that involved some aspect of goalposts, albeit with a catch-all third category, to a test that involved a more subjective barometer. Just as the Court’s “not the only one” language foreshadowed more to come, this new test in *Mayo* in the medical diagnostics context cried out to be cloned into business methods. This *Alice*⁵³ did.

Alice so closely resembled *Bilski* that, notwithstanding the industry reaction to *Alice* as a gamechanger, an argument could be made that *Alice* did nothing more than reiterate and incorporate Judge Rader’s dissent in *Bilski* as the test—that applications for processes and methods that seek to patent

⁴⁹ See *Parker v. Flook*, 437 U.S. 584, 595 (1978).

⁵⁰ See *Mayo*, 566 U.S. at 72.

⁵¹ See *id.*

⁵² See *id.* at 79.

⁵³ *Alice Corp. Pty. v. CLS Bank Int’l*, 573 U.S. 208 (2014).

an abstract idea and nothing more will never be patentable.⁵⁴ Perhaps the patent community should have been on notice from then. While *Bilski* involved a method for avoiding or minimizing against risks of price fluctuation,⁵⁵ *Alice* involved mitigation of risks in settlement via a neutral third party.⁵⁶ Both involve principles in economics,⁵⁷ and absent any intervening change in the law or new test announced by the Court, one might have predicted that the patents in *Alice* would have been found patent ineligible just as was the case in *Bilski*.⁵⁸

Accordingly, two years post-*Mayo*, when faced with the patents in *Alice*, the Court extended the *Mayo* two-step test to business-method patents, while indicating an intent to permit patents involving a judicial exception only when the “additions” are sufficient so as to ensure the patent is not the exception itself.⁵⁹

In both *Mayo* and *Alice*, the emphasis was on “something more”—integrating into something more, transforming into something more, performing something more—and determining whether the additions recited in the claims are “enough.” Notwithstanding this repeated emphasis on “more” and “enough,” the Court provided little direct instruction in what is “enough” so as to be “more.” Given the extent to which the Court describes circumstances that are excluded from “enough” and “more,” while expressly refusing to “labor to delimit the precise contours of the ‘abstract ideas’ category,” one can only assume that the Court did not intend to provide a

⁵⁴ *In re Bilski*, 545 F.3d 943, 1011 (2008) (Rader, J., dissenting).

⁵⁵ *Id.*

⁵⁶ *Alice Corp.*, 573 U.S. at 208. What was at issue, here, was the concept of ensuring that both parties to an agreement would pay or perform their obligations—through having a “trusted third party” verify payment or performance of both parties before any consideration was released to either party. In *Alice*, the claims involved a major concept in economics—i.e., using an intermediary to assess or mitigate risk. Using a computer, without more, does not render the concept “inventive” where the core remains the idea itself. For instance, while the idea of adjusting cost based on supply and demand is a basic one in economics and, therefore, a method described that involves a computer gauging and reporting the volume of demand, comparing with available supply of vendors for a product, and then using an algorithm adjusting the cost to be charged, would not be patentable. Such a method does not describe anything other than already known concepts in economics and business.

⁵⁷ Just like in *Bilski*, the claims in *Alice* read to risk management methods, and specifically, “a computerized scheme for mitigating ‘settlement risk.’” *Id.* at 213. Just as *Bilski* involved a third-party intermediary, so too did *Alice*. The claims in the four patents at issue were “designed to facilitate the exchange of financial obligations between two parties by using a computer system as a third-party intermediary.” *Id.*

⁵⁸ “Like the risk hedging in *Bilski*, the concept of intermediated settlement is “a fundamental economic practice long prevalent in our system of commerce,” and “the use of a third-party intermediary (or ‘clearing house’) is a building block of the modern economy.” *Id.* at 219–20. “[I]ntermediated settlement, like hedging, is an ‘abstract idea’ beyond the scope of § 101.” *Id.* at 220.

⁵⁹ *Id.* at 225–27.

bright-line or create a predictable test.⁶⁰ Having started out with the pronouncement of the judicial exceptions on a clean slate and now having a test articulated as purposefully non-restrictive, over the past four decades, the Court seemed to have come full circle with respect to articulating the ways a patent application for process or method may escape or fall within the judicial exceptions.

B. *The Legal Aftermath*

In other areas of U.S. law, when the rules change in such a way as would be a detriment to some, they are only applied prospectively, in the interests of notice and predictability, with ex post facto laws being generally discouraged.⁶¹ However, in patent law, when the rules change as to patent eligibility, even though inventors could not have been on notice of not yet created rules, restrictions, or their implications, their inventions may be subjected to invalidation,⁶² which does not trigger ex post facto concerns, since it is not the passage of a law but a determination that the patent was invalid at inception or is invalid under current law. In one sense, this is defensible; the stakes in allowing a patent to an innovation—public disclosure at the price of exclusive and enforceable rights to monopoly—are quite high. It should follow then that at any given time, society would only want those rights to be enforceable by people whose innovations are, as of that moment, recognized as within the scope of patent-eligible subject matter. Instead of a static patent system, changing laws and reassessment of the scope of patentability renders the system dynamic and responsive to the changes in technology and one where enforceable monopolies reflect current scientific knowledge.

⁶⁰ *Id.* at 221.

⁶¹ See U.S. CONST. art I, §§ 9, 10.

⁶² See 35 U.S.C. § 282 (2019); 35 U.S.C. § 271 (2019) (infringement actions may be brought anytime during patent term, and since invalidity is a defense to infringement, then invalidity proceeds may also be brought any time during the term of a patent); see also *Inter Partes Review*, UNITED STATES PATENT & TRADEMARK OFFICE, <https://www.uspto.gov/patents-application-process/appealing-patent-decisions/trials/inter-partes-review> (last modified May 9, 2017); *Post Grant Review*, UNITED STATES PATENT & TRADEMARK OFFICE, <https://www.uspto.gov/patents-application-process/appealing-patent-decisions/trials/post-grant-review> (last modified May 9, 2017); Ryan Kenny, *Which Invalidity Avenue to Take: Inter Partes Review Verses Post-Grant Review*, IPWATCHDOG (July 31, 2018), <https://www.ipwatchdog.com/2018/07/31/which-invalidity-avenue-ipr-verses-post-grant-review/id=99460/>; Shruti Mehta, *Alternative Pathways for Challenging Patent Validity in the US*, IQVIA (May 2, 2019), <https://www.iqvia.com/blogs/2019/05/alternative-pathways-for-challenging-patent-validity-in-the-us>.

Unsurprisingly then, in the wake of *Alice*, there has been extensive activity at all levels involving process patents,⁶³ which had been predicted in Judge Rader's dissent in the Federal Circuit,⁶⁴ in addition to hefty criticism from the patent community.⁶⁵ First, there was a substantial amount of litigation; more than 7,000 decisions have cited *Alice* in only five years (2014–2019),⁶⁶ averaging over 1,400 cases each year. In the same time frame, over 6,000 decisions in the U.S. Patent and Trademark Office have cited or otherwise relied on *Alice*. *Alice* has definitely won the middle school popularity contest. As would be expected, the substantial volume of these cases (all but 140) is in the federal district court, where infringement claims are raised and invalidity proceedings end up after agency reexamination and appeal. In almost every case, at some point in district court, the alleged infringers file dispositive motions (e.g., motions to dismiss the claim of infringement or motions for summary judgment in their favor), asserting that the patent(s) are invalid due to being drawn to patent-ineligible subject matter.

These motions are usually denied because they address patent validity at an early stage in the litigation.⁶⁷ On a motion to dismiss, where there is a clear inability to sustain the claim or the “inevitable success [of defendant] on an affirmative defense,” the court should grant the motion and dismiss the complaint.⁶⁸ Similarly, on a motion for summary judgment, the court should grant the motion where there are no genuine issues of material facts as to a threshold issue—such as patent eligibility.⁶⁹ *Alice*'s two-step analysis has

⁶³ See, e.g., Erin Coe, *The Battle for Patent Law: Federal Circuit Looks to Hold the Line as Supreme Court Eyes IP*, KIRKLAND & ELLIS (2016), [https://www.kirkland.com/siteFiles/News/Law360%20\(The%20Battle%20for%20Patent%20Law_%20OQuinn\)%20July%202016.pdf](https://www.kirkland.com/siteFiles/News/Law360%20(The%20Battle%20for%20Patent%20Law_%20OQuinn)%20July%202016.pdf).

⁶⁴ *CLS Bank Int'l v. Alice Corp. Pty.*, 717 F.3d 1269, 1313 (Fed. Cir. 2013) (Moore, J., dissenting) (“[I]f all of these claims, including the system claims, are not patent-eligible, this case is the death of hundreds of thousands of patents, including all business method, financial system, and software patents as well as many computer implemented and telecommunications patents.”).

⁶⁵ See, e.g., Taskalos, *supra* note 35 (“The relative fluidity of patent eligibility jurisprudence since the Court's decision in *Alice* has caused difficulties not only for potential inventors and industry, but also for the patent bar at large.”).

⁶⁶ As of January 24, 2020, there were 7,401 federal court opinions citing *Alice*. Of these 125 were from the Federal Circuit, which though comparably few, still constitutes an average of 25 opinions each year or one opinion every two weeks.

⁶⁷ See, e.g., *Nike, Inc. v. Puma N. Am. Inc.*, 2018 U.S. Dist. LEXIS 174359, at *7 (D. Mass. 2016) (motion to dismiss denied); see also *CardioNet, LLC v. ScottCare Corp.*, No. 12-2516, 2017 U.S. Dist. LEXIS 173622 (E.D. Pa. Oct. 19, 2017) (motions to exclude evidence and testimony of expert witnesses as to infringement and non-infringing alternatives, which could have determinative effect for one or another side, were denied).

⁶⁸ See *supra* note 67.

⁶⁹ “When there is no genuine issue of material fact regarding whether[, for example,] the claim element or claimed combination is well-understood, routine, [and] conventional to a skilled artisan in the relevant field, this [Section 101] issue can be decided on summary judgment as a matter of law.”

created an inroad for defendants to seek application of *Alice* earlier and earlier in proceedings seeking judgment in favor of the alleged infringer; in some cases, alleged infringers have found filing dispositive motions at the district court level effective.⁷⁰

Meanwhile, there have been just over 100 decisions from the Federal Circuit in that same time, which is even still a substantial number, since it suggests a rate of twenty appellate decisions involving similar *Alice* issues each year.

Three post-*Alice* cases in the Federal Circuit have helped to provide some modicum of clarity of how the nation's only exclusive patent court views *Alice*. The Federal Circuit grappled with identifying where step one of the *Alice* inquiry ended and where step two began. It has also attempted to flesh out what the "something more" was in the context of a range of patents triggering judicial exceptions.⁷¹ Among these decisions, *DDR Holdings*,⁷² *Enfish*,⁷³ and *Electric Power*⁷⁴ are notable.

First, the court laid groundwork for the potential to excise itself from the entanglements of the *Mayo/Alice* test, by isolating only those cases where it need venture past step one into step two. For those cases where the inquiry ends at step one, the court need not dance with *Alice*.

In *Enfish*,⁷⁵ the court found the claims were patent eligible because they fell outside step one—as neither laws of nature, natural phenomena, nor abstract ideas. As the Federal Circuit put it, claims directed to an

S.I.SV.EL. Societa Italiana per lo Sviluppo Dell' Elettronica S.p.A v. Rhapsody Int'l Inc., No. 18-69-MN-CJB, 2019 U.S. Dist. LEXIS 37508, at *12–13 (D. Del. Mar. 8, 2019) (quoting *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1368 (Fed. Cir. 2018)) (granting defendants' motion for summary judgment as to '202 patent) (alterations in original). *But see* S.I.SV.EL v. Rhapsody Int'l Inc., No. 18-69-MN-CJB, 2019 U.S. Dist. LEXIS 39305 (D. Del. Mar. 12, 2019) (denying defendants' motion for summary judgment as to '123 patent because of conflict between testimony by plaintiff's expert and defendant's expert regarding whether the ordered combination in the claims demonstrated novelty).

⁷⁰ See, e.g., *Tele-Publishing, Inc. v. Facebook, Inc.*, 252 F. Supp. 3d 17, 27–28 (D. Mass. 2017) (granting motion for summary judgment on the basis of finding claims to be drawn to an abstract idea in *Alice* step one and failing to contain an inventive step in *Alice* step two); *Smart Software, Inc. v. PlanningEdge, LLC*, 192 F. Supp. 3d 243, 249–50 (D. Mass. 2016) (granting defendant's motion to dismiss because the patent "fails to provide the necessary inventive concept" in *Alice* step two); *Zkey Invs., LLC v. Facebook Inc.*, 225 F. Supp. 3d 1147, 1155–59 (C.D. Cal. 2016) (granting motion for summary judgment to alleged infringer based on *Alice* step two). *But see* *Zak v. Facebook*, 206 F. Supp. 3d 1262, 1264–65 (E.D. Mich. 2016) (denying motion for summary judgment on basis of demonstrating an inventive step in *Alice* step two).

⁷¹ See *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1366 (Fed. Cir. 2018); *Aatrix Software, Inc. v. Green Shades Software, Inc.*, 882 F.3d 1121, 1128 (Fed. Cir. 2018).

⁷² *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245 (Fed. Cir. 2014) (upholding validity of computer-implemented patent claims after *Alice*).

⁷³ *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327 (Fed. Cir. 2016).

⁷⁴ *Elec. Power Grp., LLC v. Alstom, S.A.*, 830 F.3d 1350, 1353–54 (Fed. Cir. 2016).

⁷⁵ *Enfish*, 822 F.3d at 1691–92.

improvement of, not in addition to, computer functionality are not in and of themselves abstract ideas under step one. One could argue that there is a very fine line between an addition to an invention and an improvement of the invention, given that often improvements involve additions and some additions operate to improve. Nonetheless, here the Federal Circuit escaped from grappling with *Mayo/Alice*, while reaching a positive outcome for the patent holder.

By comparison, in *DDR Holdings*,⁷⁶ the court danced the two-step, finding that the patents did indeed read to patent eligible subject matter. There, the matter indisputably put the court on the dance floor—there was an abstract idea of how hyperlinks work coupled with connections and coding on the back end, not visible to the user.⁷⁷ Yet the court found the claims patent eligible at step two because they went beyond the “routine and conventional sequences” in website traffic. Of significance to the court was that the claims described a process involving a “disruption of the typical” hyperlink pathway to achieve a result responsive to a particular problem. By contrast, claims involving use of computers will necessarily fail *Alice* step two where they “‘add’ only generic computer components such as an ‘interface,’ ‘network,’ and ‘database.’”⁷⁸ and neither “‘improve the functioning of the computer itself’ or ‘effect an improvement in any other technology or technical field.’”⁷⁹

Third, and by contrast, in *Electric Power*, the patents described and claimed real-time performance monitoring and were found to be patent ineligible under the test.⁸⁰ Honing in on the terms “collecting information,” “analyzing information,” and “displaying results,” all admittedly abstract concepts, the court pushed the analysis into step two.⁸¹ The claims failed there for adding nothing other than a limitation of “unconventional processes” to the particular field and the claimed processes being indistinguishable from the steps involved in “ordinary mental processes” which are excluded from section 101. *Electric Power* is concerning for AI innovations exactly because their explicit purpose and benefit is often to substitute for “ordinary mental processes.”⁸² If more efficient improvements and ways of performing ordinary mental processes by use of computer technology are not patent eligible, under the argument that such processes are “typical” and “routine,” then quite a bit is at stake at being excluded from patent protection. Problems

⁷⁶ *DDR Holdings*, 773 F.3d at 1255.

⁷⁷ *Id.* at 1257.

⁷⁸ *Mortg. Grader, Inc. v. First Choice Loan Servs.*, 811 F.3d 1314, 1324 (Fed. Cir. 2016).

⁷⁹ *Id.* at 1325 (quoting *Alice*, 572 U.S. at 225).

⁸⁰ *Elec. Power Grp., LLC v. Alstom, S.A.*, 830 F.3d 1350, 1351, 1353 (Fed. Cir. 2016).

⁸¹ *Id.* at 1353–54.

⁸² *Id.* at 1355.

arise in creation of AI systems and innovations created by them, where what the patent application truly is seeking to protect is a function of mathematics, statistics, and data, as it relates to a particular industry. There, it may truly be novel—but the applicant will butt up against the existing case law on judicial exceptions and certainly *Mayo/Alice*. In these instances, both in and outside of AI, it is to be expected that a large majority of business methods that are grounded in manipulating information and not “doing” or “creating” something unconventional and nonroutine from that data will be patent ineligible under the guise of being themselves the building blocks of business strategies of tomorrow.

With this volume of litigation in such a short timeframe, there is some concern that the current *Mayo/Alice* test is unclear, confusing, and difficult to apply.⁸³ This translates into the concern, notwithstanding the ability to retrain and develop new strategies,⁸⁴ that where there is uncertainty, application of the test would similarly be unpredictable.⁸⁵ In this industry, allegations of uncertainty tend to skew towards predictions of rejections of pending applications and invalidations of already-issued patents, in either case increasing the dockets pertaining to section 101 challenges.

C. Agency Adaptation

The patent community has generally opined that as the legal landscape has shifted, purportedly in response to changes in technology, inventors and patent practitioners have struggled to adapt prospective and existing process applications and defend issued process patents from invalidation. Some go so far as to say that changes in defining patentable processes have had a negative effect on research and development as evidenced by the volume of patent applications, issued patents, and invalidity proceedings, particularly in terms of patents involving implementation on a generic computer.⁸⁶

⁸³ See also Gene Quinn, *Mayo v. Prometheus: A Lawless Decision by an Omnipotent Court Wreaking Havoc on Patents* (Jan. 23, 2017), <https://www.ipwatchdog.com/2017/01/23/mayo-v-prometheus-lawless-decision-wreaking-havoc-patents/id=77438/> (criticizing *Mayo* and *Alice*).

⁸⁴ See, e.g., Charles Bieneman et al., *How to Practice Patent Law After Alice*, HOLZER PATEL DRENNAN (Feb. 2012), <http://hpdllaw.com/wp-content/uploads/2012/02/How-to-Practice-Patent-Law-After-Alice.pdf>.

⁸⁵ See, e.g., Lara Cartwright-Smith, *Patenting Genes: What Does Association for Molecular Pathology v. Myriad Genetics Mean for Genetic Testing and Research?*, 129 PUB. HEALTH REP. 289 (2014) (discussing confusion/lack of clarity in health and medicine after *Myriad* Supreme Court).

⁸⁶ See, e.g., *Decoding Patent Eligibility Post-Alice*, FENWICK & WEST, <https://www.fenwick.com/pages/post-alice.aspx> (last updated Oct. 17, 2019) (displaying graphic showing comparison of upheld and invalidated cases and bases for each decision, through Oct. 2019); *Chart of Post-Alice Cases*, GIBSON DUNN (Mar. 1, 2019), <https://www.gibsondunn.com/wp-content/uploads/2019/03/Overview-of-Section-101-Patent-Cases-Decided-After-Alice-v-CLS-as-of-03-01-19.pdf>.

However, while the Patent and Trademark Office has certainly issued a number of guidance documents and reports addressing section 101 examination,⁸⁷ in response to changes in the law and particularly after *Alice*,⁸⁸ as a forward-thinking society, we should be encouraged by a dynamic and responsive patent agency. It certainly makes it more difficult for patent practitioners to keep up when there are multiple Guidance documents describing how examiners will assess patent eligibility for processes within the same calendar year.⁸⁹ These changes reflect that the Office is self-reflective, evaluating, assessing, and revising its practices as it learns from its own outcomes. There is no requirement of a set schedule for issuing new Guidances, and it may be argued that the Office's latitude to update Guidance documents as it sees fit and necessary should result in greater certainty that patents that issue from the office in the wave of new Guidance documents responsive to *Alice* are less likely to be threatened or invalidated than if fewer clarifying memos and documents had been provided.

Some argue that immediately after *Alice* we saw an immediate drop in the number of business-method patents being allowed, as demonstrated by a drastically different rate of Allowance Per Office Action (APOA) as compared to pre-*Alice*, and that fact is indicative of it being more difficult to get a patent through to allowance in the post-*Alice* world.⁹⁰ This author submits that an immediate decline in allowances is exactly what one should expect when a test is changed, particularly if the applications that had been pending at that time were filed and being examined using an altogether different structure. No patent application is filed, examined, and allowed on the same day. Thus, when both *Mayo* and *Alice* were decided, the applications pending at those times would have been filed with prior tests in mind. Once charged with applying the new tests and provided Guidance via the agency, examiners would look at their pending patent applications and ascertain

⁸⁷ See *Subject Matter Eligibility*, USPTO, <https://www.uspto.gov/patent/laws-and-regulations/examination-policy/subject-matter-eligibility>.

⁸⁸ Taskalos, *supra* note 35 ("Since the *Alice* decision, the USPTO has issued new guidance regarding how patent examiners are to analyze claims under section 101 at least once a year, with the exception of 2017. As many practitioners would attest, the application of the guidance can vary between examiners and art units, resulting in general confusion as to what exactly makes one claim patent eligible over another.").

⁸⁹ For instance, the October 2019 Guidance replaced the January 2019 Guidance.

⁹⁰ See Mark Nowotarski, *Business Method Patents Recover Under USPTO Guidance*, IPWATCHDOG (May 19, 2019), <https://www.ipwatchdog.com/2019/05/19/business-method-patents-recover-uspto-guidance/id=109307/> ("[A]llowances per office action (APOA) dropped from 17% before the 2014 *Alice* decision to 4% right after the *Alice* decision . . . APOA rose to 17% in 2019 after the new 2019 Guidance came out in January, [which is] . . . its pre-*Alice* level.") Allowances per office action ("APOA") means the average number of rejections to which the applicant responds prior to receiving an allowance. Therefore, an APOA of 1/5 (~20%) means that an applicant is likely to receive an allowance after 5 prior office actions. By comparison, APOA of 1/20 (~5%) means that the applicant will likely face 20 office actions (a sum that is impracticable) prior to an allowance, translating into very few allowances.

which already met the new test thresholds and predictably many would not. Given that the new test would take some time for practitioners to integrate, it should not have been a shock when there were many rejections immediately after *Alice*.

What is more indicative of the difficulty level of prosecuting a process or business method patent post-*Alice* is the current rate of Allowances Per Office Action (APOA). Sufficient time has elapsed since *Alice* that patents more recently allowed were more likely to have been filed with inventors and practitioners in full knowledge of the *Mayo/Alice* framework. These applications certainly would have been examined using that framework and the various Guidance documents provided to examiners by the PTO. And thus, the current APOA (2019) which is identical to the pre-*Alice* APOA is a better indicator as to whether it is more difficult to prosecute a process or business method patent in the Office. When viewed through this lens factoring in time and revision of office practices, this author suggests it is neither more difficult nor less so to obtain an allowance

D. *What the Future Holds: The Legislative Lion?*

It is an understatement to say that the industry was displeased with the *Mayo/Alice* test.⁹¹ With many patents being invalidated, since as mentioned above, they would not have been prosecuted with that test in mind, it should come as surprise to absolutely no one that industry would lobby for anything that could result in unearthing *Mayo/Alice*.⁹² Accordingly, with pressure from stakeholders,⁹³ Congressional activity through 2019 was plentiful. Of major significance is that which was largely unseen—a draft bill proposing patent reform, that aimed in part to amend section 101. The formal bill stalled initially due to disagreements about the proposed amendment to section 112(f) and the interplay between sections 101 and 112,⁹⁴ and later due to

⁹¹ See *Parker v. Flook*, 437 U.S. 584, 589 (1978).

⁹² See, e.g., Taskalos, *supra* note 35 (“The impetus for such reform stems from uncertainties in recent case law regarding what qualifies as ‘patent-eligible’ subject matter since the U.S. Supreme Court’s holdings in *Mayo Collaborative Services, DBA v. Prometheus Labs., Inc.*, 566 U.S. 66 (2012), and *Alice Corporation Pty. Ltd. v. CLS Bank International*, 573 U.S. 208 (2014).”).

⁹³ Eileen McDermott, *Draft of Proposed New Section 101 Reflects Patent Owner Input*, IPWATCHDOG (May 22, 2019), <https://www.ipwatchdog.com/2019/05/22/draft-text-proposed-new-section-101-reflects-patent-owner-input/id=109498/> (Range of comments and reactions on the draft bill, including “Hank Johnson: ‘Section 101 of the Patent Act is foundational to the patent system, but recent court cases have upset what should be solid ground.’”).

⁹⁴ Anthony J. Fuga, *Bloomberg Law: There Is a Lack of Consensus Among Stakeholders on Patent Eligibility Reform*, HOLLAND & KNIGHT SECTION 101 BLOG (Oct. 18, 2019), <https://www.hklaw.com/es/insights/publications/2019/10/bloomberg-law-there-is-a-lack-of-consensus-among-stakeholders>.

“reasonable concerns about the draft.”⁹⁵ Given the potential for uptake of this issue in a future Congress,⁹⁶ the draft that was released and the discussions in hearings⁹⁷ are illuminating as to the ideas floated and discussed between the Subcommittee and stakeholders.

In the draft bill released in May 2019, section 101 would have included the following language:

The provisions of section 101 shall be construed in favor of eligibility.

No implicit or other judicially created exceptions to subject matter eligibility including “abstract ideas,” “laws of nature,” or “natural phenomena,” shall be used to determine patent eligibility under section 101, and all cases establishing or interpreting those exceptions to eligibility are hereby abrogated

The eligibility of a claimed invention under section 101 shall be determined without regard to: the manner in which the claimed invention was made; whether individual limitations of a claim are well known, conventional or routine; the state of the art at the time of the invention; or any other considerations relating to sections 103, 103, or 112 of this title.⁹⁸

Of critical significance is that the language in this bill would have sought to explicitly remove the judicial exceptions from the determination of patent-eligibility, effectively vaporizing decades of case law and raising questions

⁹⁵ In early 2020, “Senator Thom Tillis, Chair of the Senate’s Subcommittee on Intellectual Property, noted that the Subcommittee is not against patent eligibility reform, but “all stakeholders [need] to work with Senator Coons and [him] to develop a consensus driven approach.” Short of this, according to Tillis, the Subcommittee “would not be [able to] complet[e] its work on legislatively addressing patent eligibility” due to “the reasonable concerns that have been expressed about the draft as well as the practical realities of the difficulty of passing legislation . . . in this Congress.” Michael Borella, *The Zombie Apocalypse of Patent Eligibility Reform and a Possible Escape Route*, PATENT DOCS (Feb. 4, 2020), <https://www.patentdocs.org/2020/02/the-zombie-apocalypse-of-patent-eligibility-reform-and-a-possible-escape-route.html>.

⁹⁶ *Id.* (Based on Sen. Tillis’ statements, it appears that patent eligibility reform is “in an undead state—ostensibly alive but not currently breathing.”).

⁹⁷ April 17, 2019: release of “bipartisan bicameral framework” for reform of section 101. Press Release, Thom Tillis, U.S. Senator (April 17, 2019), <https://www.tillis.senate.gov/2019/4/sens-tillis-and-coons-and-reps-collins-johnson-and-stivers-release-section-101-patent-reform-framework>. May 22, 2019: Draft bill released; June 2019: Public hearings; Formal Bill was announced as expected in September or October 2019. However, 2019 ended without introduction of the bill into Congress.

⁹⁸ This draft bill was provided to many stakeholders and thus is written about and found on a number of private websites. As a Senate proposed bill, but not yet formally introduced or numbered, the only government site where it could be reasonably located was the Senate website’s file. SENATE.GOV, <https://www.tillis.senate.gov/services/files/E8ED2188-DC15-4876-8F51-A03CF4A63E26> (last visited Jan. 4, 2020).

as to retroactivity to pending applications and recently allowed patents, or only prospective filings.⁹⁹ The judiciary's role has always been to interpret that which is written—either in the Constitution or in statutes created by Congress. Particularly, the highest court's purpose is to ensure consistency and harmony between the different sub-branches, and the foundational documents. For these systems to work, while there may be times when one branch needs to “check” and rectify the actions of another, there is also a level of trust and respect necessary and that all are acting with the best interests of the nation at hand.

While some have argued in support of proposals that abrogate *Bilski/Mayo/Alice*,¹⁰⁰ there are other ways to achieve the goal of broadening the scope of patent eligibility, if that is what Congress so chooses to do, without discarding a virtual library of precedent and replacing it with a vacuum.¹⁰¹ In other situations where Congress has sought to respond to judicial outcomes, it has chosen to pass amendments or new statutory provisions stating more clearly how it intends for the matter to be resolved. This approach considers all we know and all we can foresee, not by asking what should have been done, but by focusing on what the law should be in light of our present and foreseeable knowledge. However, contrary to this informed forward-looking perspective, proposals like the draft bill which support abrogation of *Bilski/Mayo/Alice* purposefully rest Office Actions of tomorrow on a foundation from a prior era, based on an implicit assertion that our patent eligibility jurisprudence permitted broader discoveries when we knew less. These proposals would have patent prosecution of today's technologies evaluated based on language formulated at a time when humankind knew a microscopic fraction about innovation of what we now know. When prosecuted through that framework, almost everything would be patent eligible¹⁰²—which may in fact have the opposite effect than that intended. If “everyone” can get a patent, then the value of each decreases, as the volume of patented processes increases, and companies have increased (though potentially patent invalid) options for development. This shifts the

⁹⁹ It should be noted that as per Article I, Section 9 and Section 10 of the U.S. Constitution, Congress and the states are prohibited from passing ex post facto laws. If this bill were to become law, some would argue that it could only apply prospectively and could not operate to revalidate/reopen already invalidated patents.

¹⁰⁰ See, e.g., Borella, *supra* note 95 (proposing that we should “(i) let § 101 reform happen, abrogating *Alice*, *Mayo*, and essentially all § 101 jurisprudence since the 1952 Patent Act, so that there are no more ill-defined judicial exceptions, and (ii) allow rapid, limited-scope, pre-discovery motions for claim invalidity in district courts.”).

¹⁰¹ Greenspoon, *supra* note 33 (“*Alice* was an interpretation of *Mayo*, which was an interpretation of *Flook*, which was an interpretation of *Benson*, which was supposed to be an interpretation of what Congress meant by the short and crisp statement of Section 101 of the Patent Act. But just as a photocopy of a photocopy of a photocopy gets more distorted with each generation, so did Supreme Court rulings.”).

¹⁰² *Id.*

burden of examination from a corps of science, technology, and engineering examiners in the Patent Office to a wide array of district court judges from different backgrounds with varying levels of experience and exposure to the complex underpinnings of patent law. Moreover, it leaves the judiciary to sort the wheat from the chaff by addressing patent eligibility solely in motions, greatly increases the stakes in pre-trial motion practice, rests undue and possible excessive weight on expert testimony, and risks overwhelming the district courts with unnecessary litigation. Moving one complication into another branch defers the analysis; it does little to resolve the issue at the core—what should be eligible for patent?

If Congress seeks to amend the Patent Act, and in particular address patent eligibility, it needs to “do one better” than the Court in undertaking that mission, and it should not dial back from that responsibility by offloading it elsewhere in the pipeline. At present, one criticism of the *Mayo/Alice* test is that it is so vague that it makes potentially everything and nothing patent eligible, which is actually as broad and flexible as the Court intended for it to be. Should Congress eventually pass legislation that removes all guideposts from patent eligibility, the threshold for patent eligibility of innovations would also be so broad as to render everything and nothing patent eligible. As such, the patent community stands to be in no better a situation than the current one by removing these goalposts, as bitter as they taste. Instead of searching in the dark for “something more,” we would be bumping heads in the dark against every Tom, Dick, and Harry with a patent, relying entirely on firm and consistent application of the other sections of the Patent Act and uniform and consistent testimony and judicial decision on motions across 94 districts to invalidate or block the true overbroad applications and patents.¹⁰³ The power to correct the ambiguity by revising the language in section 101 is one of Congress’ core powers granted to it and responsibilities expected of it by the Constitution. It is imperative that Congress itself come together, engage with stakeholders, and make the difficult decisions in recognition that it is impracticable to expect an outcome on reform that satisfies all the desires of all parties, but it is not impossible to create a solution that provides a clearer path.

VI. SO, WHAT NOW?

Society and the patent community need to continue to take active roles in determining what they want the process patent landscape to look like. At all levels, it is important to recognize that as technology advances the determination of what is foundational is going to become a more complex,

¹⁰³ *Id.*

higher baseline—e.g., when we knew little, then much more simple technology was the foundation, but the more we know, the thicker and more advanced the foundation for it is. It logically follows that we would not want to limit access to the foundation, since doing so threatens to impede the wheels of progress. One problematic aspect of deferring too much to the judiciary to interpret technology-based aspects of law is that the continual change of tests for patent eligibility continues to result in the invalidation of a patent to an innovation that was fairly allowed and novel under the test of its time but fails under a test of the future. This retroactive effect in patent invalidity proceedings exists even though applying legislative provisions retroactively is disfavored when doing so would impair a substantive right.¹⁰⁴

One plausible means of addressing process patent invalidity solely based on retroactive application of a judicial interpretation or test would be to implement a graduated invalidity scheme. For those patented innovations that would not be patent eligible if examined “today,” the patent owner would be provided with a notice period, followed by a step-down approach to the rights afforded from the patent grant. This would have less harsh results than immediate invalidation. In one iteration of this model, particular claims in a patent that were validly allowed at the time issued, but fail to pass a future test for patent eligibility could carry a one-year notice period, during which the innovation is compulsory licensed or otherwise contractually shared with public research institutions and entities, and after the notice period being freely available to all.

It is difficult to predict how a future Court will interpret section 101 and the existing tests, and this temperamental unpredictability complicates patent prosecution and for companies can make it difficult to recoup Research & Development costs without scattershot patent filings in the hope something sticks longer term. If this retroactive and thereby by definition unpredictable variation in patent validity on section 101 is unpleasant to Congress and various stakeholders, then Congress needs to uphold its duty and continue to work to devise a statutory structure that pulls section 101 into “today” and better encapsulates what threshold process patents must pass in the world of 2020 and beyond.

The outcomes discussed herein are not to say that companies cannot use economic principles, data and statistics, or medical diagnostic processes to further their businesses and gain success over competitors, nor that companies have no means to keep competitors from using the same models

¹⁰⁴ See e.g., *Bank Markazi v. Peterson*, 136 S. Ct. 1310, 1324-25 (2016) (discussing Constitutional restrictions on retroactive legislation); *Bowen v. Georgetown Univ. Hosp.*, 488 U.S. 204, 208 (1988) (“[R]etroactivity is not favored in the law,” and its interpretive corollary that “congressional enactments and administrative rules will not be construed to have retroactive effect unless their language requires this result.”). See also *Stogner v. California*, 539 U.S. 607, 610-12 (2003) (discussing Ex Post Facto laws).

and methods, or to protect their R&D. It may be that for some types of medical processes and business methods, the particular type of bargain achieved by patent—a monopoly for a term of years in exchange for open and public disclosure—may not in fact be the best vehicle for protecting the intellectual property. In some circumstances, it may be that the process or method should not be restricted in any way from the public. For example, when it comes to protecting mass public health, morality and public welfare may well override any patent bargain regardless of whether the innovation’s claims satisfied this or that test. Here, there is a defensible argument that based on best interests for society, the immediate invalidation of any patent that no longer meets the test of the time is necessary.

In other situations, inventors and researchers may opt to engage in explicit contractual relationships or collaborations for sharing of methods for periods of time, thus working towards a common goal using resources and technology beneficial to both. Further, it is conceivable that trade secrets may be of use in protecting some types of business method innovations and that for others, securing a copyright may be a more lucrative option. However, in the realm of patents, for the immediate future subject to bills to come, the *Mayo/Alice* test is bread and butter.

While the patent community may be understandably frustrated with cycles of Court interventions and transient tests, the solution is not to abolish four decades of carefully laid precedent. We would be no better off with a stagnant and uninvolved Supreme Court for the sake of “predictability”—not while the pace of innovation already outpaces our active federal judiciary—just as we are not better off with a Congressional body which abandons the task because it is too difficult. Quite to the contrary, the patent laws will be more meaningful with both the judiciary and the legislature taking active roles in ensuring that the rules and tests reflect the general intention of the era and the parties involved in process patent eligibility discussions will need to compromise for there to be meaningful patent reform.¹⁰⁵ Any reform to the standards for evaluating process patents for section 101 eligibility must yield an analytical framework that is both temperamental and transient, so that it is responsive to growing technology and not perceived by inventors or practitioners as a fixed, rigid structure. In the meantime, as long as it is the test under which process patents are examined, the “flexibility” but concomitant variability in the *Mayo/Alice* test will require more careful, deliberate, and thoughtful process patent claim drafting and prosecution in contemplation of potential alternate tests, and an eye to the future for agency Guidance documents and possible legislative action in an upcoming term.

¹⁰⁵ See Borella, *supra* note 95.