Reviving The Gatekeeping Function: Optimizing The Exclusion Potential of Subject Matter Eligibility

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REVIVING THE GATEKEEPING FUNCTION:
OPTIMIZING THE EXCLUSION POTENTIAL OF SUBJECT
MATTER ELIGIBILITY

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ABSTRACT

Today, many patents that fail the constitutional mandate “[to promote the Progress of Science and useful Arts]” are issued. Patents are granted irrespective of whether they are actually needed to incentivize innovation. Consequently, many patent grants fail to reflect an appropriate balance between the ex post costs of short-term monopoly and the benefits of higher ex ante incentives to innovate. Other patents are issued without having any prospected commercial use, so no one actually makes an economically beneficial use of them. The worst of these are those that are sought solely for the purpose of initiating infringement lawsuits and extorting licensing fees from competitors.

Finding that subject matter eligibility is the most efficient statutory mechanism having the potential of excluding unwarranted patents for practical, economic and normative reasons, this article suggests reviving its gatekeeping function. Yet, rather than advancing a traditional approach of strict categorical exclusions, it proposes a flexible approach of policy-based exclusions capable of successfully targeting and excluding unwarranted patents. In particular, it identifies two unique characteristics of unwarranted patents: the first refers to patents that cover inventions whose development is not depended on the incentives provided by the Patent Act, and the second refers to patents that lack any prospected commercial use. Such patents are economically valuable, and are therefore, particularly vulnerable to abuse by patent trolls.

Observing that neither the current doctrine of subject matter eligibility articulated by the three common law exceptions, nor the other statutory requirements for patentability, indulge these unique characteristics, this article proposes to supplement the current doctrine of subject matter eligibility with two additional policy-based requirements. The first is a showing sufficient to convince a person having ordinary skill in the art, that the invention would not have been developed “but for” the incentives afforded by the Patent Act. The second is a showing sufficient to convince a businessman that, a) there is a market for the invention, and that b) the invention can be manufactured at a cost sufficient to fulfill market demand. These requirements, this article suggests, would efficiently exclude patents that violate the policies underlining our patent system.
without falling into the trap of over-exclusiveness or under-exclusiveness associated with per se rules of categorical exclusions.

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INTRODUCTION

The Patent Act of 1952 sets forth the categories of subject matter eligible for patent protection: “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 therefore, subject to the conditions

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and requirements of this title.”1 Defining patentable subject matter affirmatively, our Patent Act does not explicitly enumerate that which is not patentable.2 As a result, various approaches throughout the history of our patent system have attempted to limit the reach of this broad statutory definition.

Traditionally, subject matter eligibility was viewed as a gatekeeper designated to keep the gates of patentability closed to specific categories of invention. The oldest among these gatekeeping approaches called to exclude “laws of nature, physical phenomena, and abstract ideas”3 for being “part of the storehouse of knowledge of all men . . . free to all men and reserved exclusively to none.”4 So long inventions pertained to the industrial world of nuts and bolts, these three judge-made exclusions adequately distinguished that which is patentable subject matter from that which is not. Nonetheless, with the advent of software and other Information Age inventions, discerning un-patentable laws of nature, natural phenomena or abstract ideas from their patentable applications became an extremely complicated task.

Accordingly, different commentators began advocating the categorical exclusion of software and business method inventions.5 Articulating a strict gatekeeping approach, they called to exclude certain types of inventions per se, rendering any case-by-case eligibility examination of software or business method inventions redundant. Ultimately, however, when the first software cases reached the Supreme Court, these allegedly bright line approaches were

discarded in favor of the application of the long standing, flexible standards expressed by the three common law exceptions.\(^6\)

When applying the common law exceptions, courts initially relied on the traditional tests they have developed to identify un-patentable subject matter. Soon, however, the physical transformation test, the mental steps doctrine, the mathematical algorithm test and the machine-or-transformation test proved to be inadequate when applied to information Age inventions.\(^7\) Therefore, the courts elected to abandon these patentable subject matter tests, adopting instead a broad reading of section 101, and virtually accepting that “anything under the sun that is made by man”\(^8\) is patentable.\(^9\)

Hence, gradually diminishing section 101’s gatekeeping role, courts acknowledged that subject matter eligibility is nothing more than a formal threshold inquiry, undertaking that, “even if an invention qualifies as a process, machine, manufacture, or composition of matter, in order to receive the Patent Act’s protection the claimed invention must also satisfy ‘the conditions and requirements of this title.’ Those requirements include that the invention be novel, nonobvious, and fully and particularly described.”\(^10\) While this relaxed approach eliminated the complexity of making hard determinations regarding subject matter eligibility, it left patent examiners and courts with only the remaining sections of the Patent Act as screens for patentability.\(^11\)

Predictably, with no adequate tools to exclude patents claiming impermissible subject matter, “unwarranted patents”—patents that fail the

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\(^6\) See Gottschalk v. Benson, 409 U.S. 63, 72 (1972) (explaining that the practical effect of granting a patent over the claimed computer program would be a patent on the algorithm itself); Parker v. Flook, 437 U.S. 584, 586 (1978) (rejecting the invention at issue for having no novel aspects that were independent from the algorithm); having no novel aspects that were independent from the algorithm; Diamond v. Diehr, 450 U.S. 175 (1981) (upholding a software-related invention notwithstanding the presence of a mathematical formula in the claimed process because “an application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.”).

\(^7\) Olson, supra note 5, at 187.

\(^8\) See Chakrabarty, 447 U.S. at 309.

\(^9\) Olson, supra note 5, at 187.


\(^11\) Olson, supra note 5, at 187.
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constitutional mandate “[t]o promote the Progress of Science and useful Arts”\(^{12}\)-began invading the realm of patentability. Today, patents are granted irrespective of whether they are actually needed to incentivize innovation. Consequently, they fail to reflect an appropriate balance between the \textit{ex post} costs of short-term monopoly and the benefits of higher \textit{ex ante} incentives to innovate.\(^{13}\) With such patents, the decreased competition and increased costs associated with patent monopoly exceed the benefit society gains from increased innovation.\(^{14}\) Other unwarranted patents are issued without having any intended commercial use. The worst of these are those that are sought solely for the purpose of initiating infringement lawsuits and extorting licensing fees from competitors.\(^{15}\) Bringing no innovation to the market, producing no beneficial end product, having no realistic public demand, and in some circumstances, diverging investment from research and development to potentially unwarranted licensing fees or litigation, these patents impede rather than promote innovation.

Accordingly, it is this article’s proposition that the formation of additional requirements for subject matter eligibility is crucial to prevent the issuance of unwarranted patents. Hence, this article will propose the adoption of two additional policy-based factors to be considered when determining subject matter eligibility under section 101. Acknowledging that a strict “one fits all” approach for determining subject matter eligibility, while incontestably certain and predictable,\(^{16}\) can not leave room “for the revelations of the new, onrushing technology,”\(^{17}\) this article will propose a flexible gatekeeping approach. Such an intermediate approach should effectively exclude unwarranted patents for violating the policies underlining our patent system without falling into the trap

\(^{12}\) U.S. CONST. art. I, § 8, cl. 8.
\(^{14}\) Olson, \textit{supra} note 5, at 193.
\(^{15}\) \textit{Id.}, at 189. These are secured by entities known as “patent trolls.” I will address their tactics henceforth.
\(^{17}\) Benson, 409 U.S. at 71.
of over-exclusiveness or under-exclusiveness associated with per se rules of
categorical exclusions.18

Part II of this article will discuss the various ways subject matter eligibility
has been approached throughout the history of our patent system. Beginning
with the traditional common law exceptions, proceeding with the rigid
categorical exclusions of software and business methods and ending with those
approaches that minimize the role of subject matter eligibility, including the
recent scope limitation approach19 and the radical “everything is patentable”20
approach, this part will attempt to situate the proposed approach in the middle
of the spectrum, slightly closer to the stricter side.21

In part III, this article will attempt to explain why it is advisable to strengthen
section 101’s gatekeeping function. In particular, it will show that counting
solely, or even partly, on the other statutory requirements for patentability to
exclude unwarranted patents22 is problematic for practical, economic and
normative reasons. As a practical matter, this part will prove that, even when an
invention appears patently old and obvious, there is a real problem of retrieving
invalidating prior art necessary to execute a novelty or non-obviousness
rejection.23

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19 Id.
21 See diagram on 10.
22 Some commentators have suggested that most if not all of the Court’s patentable subject matter precedents could be better understood in terms of other requirements for patent protection such as novelty, non-obviousness, or limitations on claim scope. See Risch, supra note 20, at 291; Dennis Crouch & Robert P. Merges, OPERATING EFFICIENTLY POST-BILSKI BY ORDERING PATENT DOCTRINE DECISION-MAKING, 25 BERKELEY TECHNOLOGY LAW JOURNAL 1673 (2010); John F. Duffy, supra note 16, at 622-23 (highlighting the Court’s ability to restrict the patent system by using the obviousness doctrine); Kristen Osenga, Ants, Elephant Guns, and Statutory Subject Matter, 39 ARIZ. ST. L.J. 1087, 1115-18 (2007) (arguing that the courts and the Patent Office “may be using § 101 rejections as proxies for other difficult questions of patentability and policy.”). This article will focus mainly on the statutory requirements of novelty and non-obviousness because these constitute the primary grounds used by patent examiners to reject claimed inventions.
23 The essence of most patent examination procedures focuses on two inquiries: novelty and non-obviousness. Novelty asks whether the invention is new, while Non-obviousness asks whether the invention is more than an obvious advance over what came before from the perspective of one with ordinary skill in the field of the invention. The availability of relevant “prior art-” the potentially
From an economic perspective, this part will demonstrate why retaining subject matter eligibility is economically efficient. Relying on real world patent litigation practices, this part will show that attacking the validity of an issued patent on subject matter grounds is cheaper than attacking patent validity on grounds related to prior art. Furthermore, it will prove that if better tools to reject unwarranted patent applications at the PTO level were formed, litigation as a whole would be reduced.

From a normative point of view, this part will explain that counting solely on the other requirements for patentability to exclude unwarranted patents is inadequate because some patents should still be excluded from patent protection, even if novel, non-obvious and adequately disclosed. In particular, this part will introduce two types of such unwarranted patents: patents covering inventions whose development is not dependent on the incentives afforded by our patent laws, and patents covering inventions that lack any prospected commercial use. Such patents are economically valuable and therefore, particularly vulnerable to abuse by patent trolls.24 Surprisingly, however, the diverse literature on subject matter eligibility has never proposed clear criteria to identify inventions having one of these characteristics on a case-by-case basis.25 After presenting these two types of unwarranted patents, this section will proceed to explain why they contradict the policies underlying our patent system. It will show that they impose social costs that are higher than their prospected benefits because they unnecessarily violate the rule of free competition and impede future innovation.

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25 David Olson argues that the most efficient patent regime is one that starts by determining initially, on a category-by-category basis, whether classes of inventions should be patentable. Only if it is determined that a class of inventions needs the incentive of the patent grant, Olson suggests to apply the other tests for patentability such as novelty, non-obviousness, and enablement/written description. Olson, supra note 5, at 201-2. Olson’s proposal articulates a traditional gatekeeping approach to subject matter eligibility as it suggests a categorical exclusion of entire fields of inventions. This article, however, addresses the problem of patents issuing over inventions that do not need the incentive of the patent grant totally differently. Specifically, it proposes that such patents should be identified and excluded on a case-by-case basis according to clear and specific criteria.
Finally, part IV will propose two new aspects of eligibility and will suggest incorporating them under the current doctrine of subject matter eligibility. The first aspect is a showing sufficient to convince a person having ordinary skill in the art, that the invention would not have been developed “but for” the incentives afforded by the Patent Act. The second is a showing sufficient to convince a businessman that, a) there is a market for the invention, and that b) the invention can be manufactured at a cost sufficient to fulfill market demand. After introducing each of these two supplemental requirements, this section will elucidate how they address the various problems caused by granting such unwarranted patents. Subsequently, it will address the benefits and the possible downfalls of these proposed requirements.

II. THE DIFFERENT APPROACHES TO SUBJECT MATTER ELIGIBILITY

Subject matter eligibility has been approached in different ways throughout the history of our patent system. Traditional subject matter approaches think about it as a gatekeeper designated to keep the gates of patentability closed to specific categories of invention. The oldest among those traditional approaches is articulated by the three historical judicial exceptions, excluding laws of nature, natural phenomena and abstract ideas. While these exceptions leave room for flexibility in their application, as demonstrated infra, other traditional gatekeeping approaches articulate a much stricter agenda. Indeed, with the advent of software and other Information Age inventions, different commentators called to strictly exclude software, business methods, tax

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26 See Diehr, 450 U.S. at 185 (holding that the Court “has undoubtedly recognized limits to § 101 and every discovery is not embraced within the statutory terms. Excluded from such patent protection are laws of nature, natural phenomena, and abstract ideas.”).

27 See, e.g., Dratler, Jr., supra note 5, at 823; Burk & Lemley, supra note 5, at 1577-1589; Rochelle Cooper Dreyfuss, supra note 5, at 263; Merges, supra note 5, at 577; Olson, supra note 5, at 227-36; Raskind, supra note 5, at 92; Hall, supra note 5.
strategies\textsuperscript{28} and other types of invention from the scope of patentable subject matter.\textsuperscript{29}

These strict approaches, however, do not dominate the majority’s view in the judiciary system.\textsuperscript{30} In fact, it seems like the traditional gatekeeping approaches to subject matter eligibility slowly fade away.\textsuperscript{31} Many of today’s popular subject matter eligibility approaches object stiff rules of categorical exclusions and view subject matter eligibility as a formal threshold inquiry.\textsuperscript{32} These approaches encourage case-by-case validity evaluations under the patentability standards of novelty\textsuperscript{33}, non-obviousness,\textsuperscript{34} and adequate disclosure, and minimize the role of subject matter eligibility.\textsuperscript{35}

It is this article’s position, that the common law exceptions articulate the most effective approach to subject matter eligibility because they actually protect the gates of patentability without excluding an entire category of invention. Such a flexible gatekeeping approach is exactly what this article intends to promote. Acknowledging that the common law exceptions cannot, alone, exclude all unwarranted patents; this article suggests supplementing them with two


\textsuperscript{29} These include the exclusion of plants and animals, see Duffy, \textit{supra} 16 at 625-32 (2009)); The exclusion of medical and surgical techniques, see Morton v. N.Y. Eye Infirmary, 17 F. Cas. 879, 882-83 (C.C.S.D.N.Y. 1862) (use of ether for anesthesia cannot be patented); Ex parte Brinkerhoff, No. 182, 24 Dec. Comm'r Pat. (1883) (Case No. 182), reprinted in 27 J. PAT. OFF. SOC'Y 797, 798 (1945) (methods of treatment of diseases not patentable), and the exclusion of printed matter (\textit{In re} Sterling, 70 F.2d 910, 912 (C.C.P.A. 1934) (bank check and stub system); \textit{In re} Reeves, 62 F.2d 199, 200 (C.C.P.A. 1932) (chart to aid in appraising buildings); \textit{In re} Russell, 48 F. 2d 668 (C.C.P.A. 1931) (system for indexing names in a directory).

\textsuperscript{30} Olson, \textit{supra} note 5, at 181.

\textsuperscript{31} Joshua D. Sarnoff, \textit{Patent-Eligible Inventions After Bilski: History and Theory}, 63 Hastings L.J. 53, 56 (2011); \textit{See also} Judge Rader’s opinion in \textit{Research Corp.} emphasizing that patentable subject matter is only a “threshold test” that need not exclude every invention that is unworthy of a patent. \textit{Research Corp.} Techs. v. Microsoft, 627 F.3d 859, 868 (Fed. Cir. 2010). Some have even suggested leaving the determination of subject matter eligibility to the end of the examination process, contending that “any claim that can be invalidated under one of the less controversial and less complex requirements for patentability—§§ 102, 103, and 112, for instance—ought to be disposed of without considering subject matter patentability.” \textit{See} Crouch & Merges, \textit{supra} note 22, at 1673.

\textsuperscript{32} 35 U.S.C. § 102.
\textsuperscript{33} 35 U.S.C. § 103.
\textsuperscript{34} 35 U.S.C. § 112.
additional policy-based requirements. Together, these two sets of flexible exceptions will optimize the gatekeeping potential of subject matter eligibility.

To enable the reader to better understand where to situate the approach advanced by this article, this section will discuss in more details the different approaches to subject matter eligibility. The following diagram illustrates where this article’s proposed approach to subject matter eligibility should be positioned with respect to the other approaches discussed hereinafter:

| Traditional Gatekeeping Approaches: Excluding Software And Business Methods. | Flexible Gatekeeping Approaches: Common Law Exceptions and this article’s suggested requirements. | Minimizing the Role of Subject: Matter Eligibility: The Scope Limitation Theory. | “Everything is Patentable” |

### A. GATEKEEPING APPROACHES

Traditional gatekeeping approaches characterize subject matter eligibility as the “first door” an invention must pass through in order to obtain patent protection.36 These approaches purport to leave some kinds of inventions outside the system while allowing others to be examined more closely within the PTO to determine their patentability. Advocating categorical rules of exclusions, traditional gatekeeping approaches are often presumed to have the potential of reducing administrative costs of the patent system by restricting the number of patent applications that require more costly individualized examination.37 The following section will describe the most prominent gatekeeping approaches to subject matter eligibility and explain their underlying policies.

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37 Id.
1. **EXCLUDING LAWS OF NATURE, PHYSICAL PHENOMENA AND ABSTRACT IDEAS**

The present Patent Act, enacted in 1952, defines in section 101 the subject matter that may be patented under the Patent Act: “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.”³⁸ While the different patent laws have defined patentable subject matter affirmatively, they did not explicitly enumerate that which is not patentable.³⁹ As a result, different gatekeeping approaches throughout the years have limited the reach of this broad statutory definition.

The oldest among these approaches calls to exclude “laws of nature, physical phenomena, and abstract ideas.”⁴⁰ Indeed, way back in 1853, when affirming a patent on a process for manufacturing lead pipes but not on the general principle of creating lead pipe, the Supreme Court stated: “[A] principle is not patentable. A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right.”⁴¹

a. **The Policies Underlining the Common Law Exceptions**

³⁹ Lee, *supra* note 2, at 93.
⁴⁰ See *Chakrabarty*, 447 U.S. at 309.
⁴¹ Le Roy v. Tatham, 55 U.S. 156, 175 (1853). See also *O’Reilly v. Morse*, 56 U.S. (15 How.) 62, 112 (1854) (holding that a telegraph patent was overly broad because it “claim[ed] the exclusive right to every improvement where the motive power is the electric or galvanic current, and the result is the marking or printing [of] intelligible characters, signs, or letters at a distance.”)
Superficially, the common law exceptions to patentable subject matter might seem to propose well-settled law in a way that categorizes them as strict rules, but in fact, the common law exceptions articulate a flexible gatekeeping approach: they exclude inventions for policy reasons regardless of their categorical pertinence. Despite the thoughtful voice calling to afford these exceptions a wide scope and categorically exclude those fields of inventions that lack creativity in the way they apply the excluded exceptions, the approach dominating our case law interprets the common law exceptions restrictively and opposes categorical exclusions of “whole fields of endeavor.”

Indeed, when applying the common law exceptions to inventions suspected of covering impermissible subject matter, the majority’s reasoning is always founded on policy considerations, acknowledging not only that section 101 is a “dynamic provision designed to encompass new and unforeseen inventions,” but also that a categorical exclusion denying patent protection for “inventions in areas not contemplated by Congress . . . would frustrate the purposes of the patent law.”

The basic policy reason courts rise when excluding an invention for claiming one of the three common law exceptions is that the subject matter covered by these exceptions must remain in the public domain in order to enable downstream research and application. As the Court stated in Funk Bros. Seed Co. v. Kalo Inoculant Co., products and phenomena of nature such as “[t]he qualities of these bacteria, like the heat of the sun, electricity, or the qualities of metals, are part of the storehouse of knowledge of all men. They are manifestations of laws of nature, free to all men and reserved exclusively to

42 Duffy, supra note 16, at 640.
43 Sarnoff, supra note 32, at 56.
44 Duffy, supra note 16, at 613. See also the majority’s opinion in Bilski v. Kappos, explaining that, “this Court has not indicated that the existence of these well-established exceptions gives the Judiciary carte blanche to impose other limitations that are inconsistent with the text and the statute’s purpose and design.” Bilski v. Kappos 130 S. Ct. at 3226.
46 See Chakrabarty, 447 U.S. at 315.
47 Lee, supra note 2, at 100.
The common law exceptions cover elements with foundational roles in scientific investigation, and therefore they should not be patented. As observed by the Court in *Gottschalk*, “Phenomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work.”

The idea that the basic tools of scientific and technological work belong to the public domain and, are therefore ineligible for patent protection is expressed also by the court’s presumption that basic tools of science are elements of the prior art, regardless of whether they were previously known. As acknowledged by the Court in *Parker v. Flook*, “Whether the algorithm was in fact known or unknown at the time of the claimed invention, as one of the ‘basic tools of scientific and technological work,’ . . . it is treated as though it were a familiar part of the prior art.”

So, abstract ideas, physical phenomena and laws of nature should not be patented because no one can claim their ownership. But, in what circumstances should we reject a claim as ineligible subject matter for claiming ownership over a basic tool of science? While understanding the principles underlining a theory is quite an easy task, appreciating how they actually work in practice is more difficult. The following subsection will demonstrate that the process of applying the common law exceptions to suspected inventions has yet to reach the point of clear, certain and predictable law. Consequently, many unwarranted patents can easily cross the gates of subject matter eligibility and enter the realm of patentability.

b. Applying the Common Law Exceptions to Subject Matter Eligibility

During the industrial Age, the physical transformation test well served the
courts in applying the common law exceptions to subject matter eligibility. Under this test, a process was found to claim a patentable subject matter if it resulted in a physical transformation in the material world. So long inventions concerned mechanical devices and processes, the physical transformation test was able to limit patents to a reasonably narrow zone, leaving abstract processes outside the realm of patent protection. Nevertheless, with the advent of the programmed computers, the effectiveness of this test has begun to erode. The transition from traditional processes that produce new, tangible products to processes that used computers to monitor timing or temperature in industrial processes called the physical transformation test into question.

At first, computer programs were excluded from patent protection. Nonetheless, it was soon acknowledged that some sorts of computer programs might be very well found eligible for patent protection. Accordingly, with small adjustments to the physical transformation test, the revised test, named “the mental steps doctrine,” attempted to draw the line between patentable computer programs and abstract ideas. Specifically, this test denied patentability to inventions consisting mainly of mathematical formulas, methods of computation, or other mental operations. The mental steps doctrine’s longevity, however, was not remarkable and in 1968 the Court of Customs and Patent Appeals

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52 The telephone cases, 126 U.S. 1 (1888) (distinguishing between the unpatentable idea of using electricity as a motive power and the patentable claims for particular processes using electricity to accomplish specified physical objectives). See also Olson, supra note 5, at 206.

53 Id. at 207.

54 Id.

55 As discussed earlier in the article, the 1966 Presidential Commission on the Patent System concluded that software should not be patentable. Subsequently, the PTO published new examination guidelines that were designed to disallow software patents and maintain the physical transformation test. Under the proposed guidelines, a computer program by itself, whether claimed as an apparatus or a process, was unpataentable subject matter. The PTO formally adopted the guidelines in 1968, acknowledging that a programmed computer could be part of a patentable process if the process was otherwise nonobvious and produced a physical result. See Olson, supra note 5, at 209.

56 Id.; In re Shao Wen Yuan, 188 F.2d 377, 380 (C.C.P.A. 1951) (denying patentability of calculation method for creation of airfoils where method is “purely mental”); In re Heritage, 150 F.2d 554, 556–58 (C.C.P.A. 1945) (denying patentability of a mental process to determine optimal application of coating material); In re Bolongaro, 62 F.2d 1059, 1059–60 (C.C.P.A. 1933) (denying patentability of a method of producing printed publications from manuscripts, even though method presents novel formula for calculating length of publication).
(“CCPA”) rejected the doctrine as a misinterpretation of prior precedents.57

The next test to govern the courts’ application of the three common law exceptions to subject matter eligibility prohibited patents over algorithms, in and of themselves. Confronted with a method for converting binary-coded decimal (BCD) numerals into the pure binary numerals, the Court in Benson explained that granting a patent “would wholly preempt the mathematical formula and in practical effect would be a patent on the algorithm itself.”58 This “algorithm exception” was affirmed six years later in Flook, which concerned a method that utilized a mathematical algorithm to continuously update alarm limits (safety limits) for a catalyzing process.59 Observing that a procedure for solving a given type of mathematical problem is unpatentable law of nature, the Court found the claimed invention to claim an ineligible subject matter.60

Just like its predecessors, however, the algorithm exception was soon abandoned. Symbolizing its abandonment is the Court’s 1980 Diamond v. Chakrabarty decision.61 While expanding the scope of patent protection to include a live, man-made microorganism, the Court discharged the long-held rule against the patentability of living things.62 More important to the context of this article, however, is the implication of this decision: In observing that, (1) courts “should not read into the patent laws limitations and conditions which the legislature has not expressed,”63 and that (2) Congress had meant patentable subject matter to “include anything under the sun that is made by man,”64 the Court implicitly expressed disagreement with drawing strict lines in these circumstances.

57 415 F.2d 1378 (C.C.P.A. 1968) (holding that even when a process may be done mentally, it should not be barred from patent protection, if it could be accomplished by another mechanism, such as a programmed computer). For a more comprehensive discussion of the involvement of the mental steps doctrine to the algorithm exception see, Pamela Samuelson, Benson Revisited: The Case Against Patent Protection for Algorithms and Other Computer Program-Related Inventions, 39 EMORY L.J. 1025, 1042,43 (1990).

58 See Benson, 409 U.S. at 72.

59 See Flook, 437 U.S. at 585.

60 Id. at 589.


62 Olson, supra note 5, at 214.

63 Chakrabarty, 447 U.S. at 308.

64 Id. at 309.
Indeed, the following Supreme Court case to concern subject matter eligibility proves that the Court’s approach towards subject matter eligibility began changing. At issue in *Diamond v. Diehr* was a process for curing synthetic rubber that included the use of a well-known mathematical formula and a programmed digital computer.\(^{65}\) Despite the similarities between *Diehr* and the previous case of *Flook*, the Court reached an opposite conclusion: *Diehr’s* claimed process was found to be patentable because it had a practical application that transformed an article into a different state or thing.\(^{67}\)

The broadest application of the common law exceptions occurred in the 1998 Federal Circuit’s *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*\(^{68}\) case. Considering whether a computer software performing the mathematical accounting steps was patentable subject matter, the court held 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.”\(^{69}\)

Nevertheless, unsatisfied with the flood of business method patents that followed *State Street*, the Federal Circuit took a step away from its broad application of the common law exceptions. In 2008, the Federal Circuit decided *In Re Bilski*, which concerned a method of hedging risk.\(^{70}\) To determine whether a claim is tailored narrowly enough to encompass only a particular application of a fundamental principle rather than to preempt all future uses of such a principle, the court applied the “machine-or-transformation” test: “a claimed process is surely patent-eligible under section 101: (1) if it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state

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\(^{65}\) *Diehr*, 450 U.S. at 177, 78 & n.2.

\(^{66}\) Olson, *supra* note 5, at 217.

\(^{67}\) *Diehr*, 450 U.S at 187.

\(^{68}\) 149 F.3d 1368 (Fed. Cir. 1998).

\(^{69}\) *Id.*, at 1373.

\(^{70}\) *In Re Bilski*, 545 F.3d 943 (Fed. Cir. 2008) (en banc).
or thing.”  The Federal Circuit held this test to be the sole test to determine subject matter eligibility, abandoning all prior tests for patentable subject matter.

The Supreme Court granted certiorari and affirmed that Bilski’s claimed invention was unpatentable abstract idea. The Court further held that the Federal Circuit’s “machine-or-transformation test” is not the sole test for determining patentability of a process under section 101. Nevertheless, the Court’s majority provided no further guidance on how the abstract idea exception should be applied. Although characterized as one having “the makings of a landmark decision in patent law,” Bilski v. Kappos in fact brought more confusion than clarity to the subject matter eligibility doctrine.

Recently, however, the Supreme Court provided some additional guidance with respect to the application of the common law exceptions. Particularly, in Mayo Collaborative Services v. Prometheus Labs., Inc., which was decided last March, the Court elaborated on the “law of nature” exception to patentable subject matter. Confronting claims to a process allegedly helping doctors who use thiopurine drugs to treat patients with autoimmune diseases to determine whether a given dosage level is too low or too high, the Court concluded unanimously that this process of correlation is unpatentable. Justice Breyer who delivered the opinion of the Court elaborated on the distinction between an unpatentable law of nature and a patentable application of such a law, explaining that the relevant question is “whether the claims do significantly more than simply describe these natural relations.” Putting it differently, Justice Breyer suggested inquiring whether “the patent claims add enough to their statements of the correlations to allow the processes they describe to qualify as patent-eligible processes that apply natural laws.” Applying this inquiry,

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71 Id., at 954.
73 Id. at 3227.
76 Id., at 3029.
77 Id.
78 Id.
the Court concluded that the process at issue merely tells doctors interested in the subject about the correlations that the researchers discovered and therefore, it simply recites an “‘administering’ step, a ‘determining’ step, and a ‘wherein’ step,” which are insufficient to transform the nature of the claim into a patentable application of a law of nature.

To sum up, while the application of the common law exceptions is constantly evolving, they continue to govern the doctrine of subject matter eligibility as matter of stare decisis. The rise and fall of the rigid tests formulated by the Court to determine subject matter eligibility show that in the long run the Court favors the creativity and flexibility associated with a case-by-case analysis over the certainty and clarity imposed by allegedly bright line rules.

2. THE CATEGORICAL EXCLUSIONS OF SOFTWARE AND BUSINESS METHODS

Those who advocate the categorical exclusions of software and business method inventions represent a traditional gatekeeping approach of strict line drawing. Although relying on policy considerations of their own, they call to exclude a certain type of invention per se, rendering any case-by-case eligibility examination of software or business method inventions redundant. This article agrees that these approaches are necessarily over-exclusive or under-exclusive: they will probably exclude some patents that should be granted and fail to exclude others that should not. Moreover, because they promote a rigid, black-or-white determination of subject matter eligibility, they are incapable of adjusting to the constant developments in technology. While these strict

79 Id., at 3036.
80 Daffy, supra note 16, at 611.
81 To be clear, these exclusions have never developed into binding law.
82 Life After Bilski, supra note 18, at 1326. See also Duffy, supra note 16, at 622-23 (2009) (“It should be a rare situation in which an entire class of patents complies with the non-obviousness requirement and yet still somehow discourages or impedes the development and spread of useful knowledge.”); Tun-Jen Chiang, The Rules and Standards of Patentable Subject-Matter, 6 Wisconsin Law Review, 1353, 1357 (2010) (“The problem with the excessive monopoly-cost theory when applied to patentable-subject-matter restrictions is one of over-inclusiveness.”).
categorical exclusions purport to strengthen the role of section 101 as a gatekeeper, they fail to leave room for flexibility, which is crucial to any subject matter doctrine.

a. The Exclusion of Software

When software related inventions begun to appear in the 1950s and 1960s, they were considered to be unpatentable subject matter. In fact, when President Johnson appointed a special commission to study the rapid developments in the software industry, the commission’s final report recommended the express exclusion of computer programs from patent protection. Several policy considerations formed the basis for those recommendations: First, it was argued that computer programs were not the kind of “processes” Congress had intended to protect by passing the patent law. Processes performed by software inventions were viewed as unpatentable “mental steps”- processes that could be performed by a person in his or her head or with the aid of pencil. Second, software was considered to be a type of invention the development of which is not depended on the Patent Act’s incentives. Because software has emerged and flourished without reliance on patents, it was believed to be outside the scope of eligible subject matter. Third, since both copyright and trade secret protection were available to protect computer programs, it appeared that patent protection was not needed in this field of invention.

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83 I use the term “software” and “computer program” alternatively as they both refer to the same thing: “a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result.” This definition comes from the Copyright Act, 17 U.S.C. § 101.


85 Samuelson, *supra* note 57, at 1038.

86 *Id.*

87 *Id.*, at 1043.

88 *Id.*, at 1044.
Today, much of the hostility against software patents focuses on the perception that such patents have “low quality,” and not on the principle that software should be categorically excluded as ineligible subject matter. It is often argued that affording software developers twenty years of government-sponsored monopoly discourages incremental innovation. Since the software industry is founded on cumulative innovation—where new programs rely heavily on preceding inventions—allowing the patentability of software is often compared to granting exclusive rights over essential building blocks. Another important criticism asserts that software patents violate the Patent Act’s balance between protection and disclosure. In this context, it is argued that software patents rarely include the source code implementation and their underlying claims are often drafted too vaguely and too broadly. As a result, with respect to software, the costs associated with granting monopoly rights outweigh the social benefit from public disclosure of valuable knowledge.

Some modern academics, however, go beyond merely criticizing the quality of software patents and advocate their overall exclusion from patent protection. One of them, professor Jay Dratler, suggests a two-factor test to determine whether an innovative project should be protected by patent law rather than by the general rule of free competition. His first factor asks whether the project

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90 Bronwyn H. Hall and Megan MacGarvie, The Private Value of Software Patents, work in process, 9. The phrase “low quality patents,” has different interpretations in the literature. The next section of this article will be devoted to explain what the author means when she uses this phrase, or its synonym, “unwarranted patents.” For know, suffice to say that “low quality” patents are patents that do not deserve the protection of our patent system.


93 Id., at 11.

94 See Olson, supra note 5, at 193-4 for a great explanation of the costs generally associated with every monopoly.
REVIVING THE GATEKEEPING FUNCTION

entails significant technological risk, or just market risk i.e., the risk of consumer non-acceptance, and his second factor asks if there is a risk of total failure of the project, “leaving the investor with nothing of intrinsic value and therefore a total sunk loss.” Only if both questions are answered affirmatively the project should be found eligible for patent protection.

Applying these factors to software, Professor Dratler finds that computer software entails no technological risk because it operates in the logic; certain world of numbers, and its development is highly structured and dependent upon well-determined, systematic man-made rules and procedures. Additionally, professor Dratler determines that with respect to software, generally, no risk of failure is involved because the programming process almost always meets the objectives of the project. Accordingly, he concludes that a “computer program that implements business, commercial, or engineering methods should not be patentable unless those methods themselves involve substantial technological risk of failure and total loss.”

Another respectful academic who has recently contended that inventions in the field of commuter programming should not be patentable is professor Peter Junger. Finding support in recent case law, professor Junger argued, that under

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95 Professor Dratler explains that “technological risk” (the inventor’s type of risk) has two features that distinguish it from marketing or market acceptance risk. First, unlike market risk, it addresses whether the project at issue will work at all, for any purpose. Second, invention involving technical risk normally involves a question of science or technology. Jay Dratler, Jr., DOES LORD DARCY YET LIVE? THE CASE AGAINST SOFTWARE AND BUSINESSMETHOD PATENTS, 43 SANTA CLARA L. REV. 823, 845-6 (2003).

96 Id. at 853-4 (explaining that, “a patent-eligible inventive project is one that involves technological risk. At the outset of the project, there is a significant risk that the project will achieve no useful result whatsoever and that, regardless of market acceptance, the work and sunk investment will be a total loss. Thus, the inventor, as distinguished from the business innovator, faces a realistic possibility of a total loss, and he does so for technological, not economic, reasons.”). Id. at 848.

97 Id. at 855 (noting that computer software is “divorced from all the dust, dirt, temperature variation, electric potentials, and contamination of the real world in which people live and invent and machines and other inventions operate.”).

98 Id. at 857-8. Nonetheless, Professor Dratler acknowledges that some sophisticated problems in technology may entail conceptual and mathematical complexities that require the development of new algorithms or programming techniques. Those rare cases may involve a technological risk, i.e. the risk of a total failure that may justify patent protection over the new and non-obvious programming technique. However, the computer program as a whole is not patent eligible according to Professor Dratler, though it may be eligible to copyright protection. Id. at 860-1.

99 Id. at 870-1.
Benson, software is unpatentable subject matter and since the Court has never overruled Benson, it is still the governing law.100 According to professor Junger, the categorical exclusion of software is appropriate because “computer programs are texts--i.e., writings--containing instructions on how to perform arithmetical and other mathematical and logical operations and, as such, may be copyrightable, but they are not within the useful arts, and thus are not patentable, because they do not ‘operate in the physical world to produce physical objects.’”101

To conclude, even though this strict gatekeeping approach of categorically excluding software from patent protection has never developed into binding law, it does attract some support in the literature.102 It is this article’s view, however, that adopting any per se rule of exclusion over simplifies the doctrine of subject matter eligibility, and is hence inappropriate. As this article will show, a case-by-case application of subject matter eligibility requirements, rather than strict rules of exclusion, is the key for a successful flexible gatekeeping approach capable of specifically excluding inventions unworthy of patent protection.

b. The Exclusion of Business Methods

Unlike the case of software, the idea of categorically excluding business methods from patent protection is quite prevalent. For centuries, a series of steps for conducting business was not considered, in itself, to be patentable subject


101 Id. at 402.

102 For additional recent scholarship questioning the suitability of patents for computer-related inventions see Russell Moy, A Case Against Software Patents, 17 Santa Clara Computer & High Tech. L.J. 67, 96-99 (2000) (recommending that statutory subject matter exclude software patents, noting the availability of copyright protection).
matter. Business methods were conceptualized as products of nature and not as the products of human creativity, and were thus, considered unworthy of patent protection. In the late 1990’s, the Federal Circuit changed this proposition and expanded the scope of subject matter eligibility to include business methods. Specifically, State Street held that the business methods exception is not firmly grounded in any case law. In response, Congress passed the First Inventors Defense Act of 1999, providing a limited defense to infringement claims for business methods. In the following years, the Federal Circuit changed course, narrowing the scope of patentable subject matter. As to the Supreme Court, its last call on the patentability of business methods rejected a per se rule of exclusion, finding that “the term ‘method,’ which is within § 100(b)’s definition of ‘process,’ at least as a textual matter and before consulting other limitations in the Patent Act and this Court’s precedents, may include at least some methods of doing business.”

Nevertheless, many academics and some judges continue to advocate the categorical exclusion of business methods. From a practical perspective, these supporters contend that business methods do not comply with the constitutional mandate that patents are issued “to promote the Progress of Science and useful Arts.” Underlining this contention is the proposition that business method patents fail to balance “between the need to encourage innovation and the avoidance of monopolies which stifle competition.” Specifically, it is argued

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107 Id. § 273(a)(3).
108 See In Re Cominsky, 499 F.3d 1365 (Fed. Cir. 2007) (rejecting a claimed process for a mandatory arbitration system for reciting nothing more than an abstract idea); In Re Nuijten, 500 F.3d 1346 (Fed. Cir. 2007) (rejecting a claim for a signal for not falling into one of the statutory categories of eligible subject matter) In Re Bilski. 545 F.3d 943 (Fed. Cir. 2008) (en banc).
110 Art. I, § 8, cl. 8.
111 Bilski v. Kappos, 130 S. Ct. at 3252. While this proposition acknowledges that not all business methods are the same, it nonetheless advocates their categorical exclusion under the assertion that ensuring
that, “companies have ample incentives to develop business methods even without patent protection, because the competitive marketplace rewards companies that use more efficient business methods.”

A new business method increases profits by making a firm a more efficient producer, improving the quality of the firm’s product, decreasing production costs, or simply by more effectively marketing the product. Moreover, it takes time for rivals to learn the new method and apply it to their own business model. During this period of time, the company who invented the new business method can reap large gains from sales. Thus, instead of applying for monopoly rights, the company can keep its new business method secret and enjoy the benefits of trade secret law.

Moreover, the internal structure of the company can provide further incentives to develop business methods, i.e. when a company awards its employees for improving its efficiency. Finally, it is contended that business innovation generally does not entail the same kind of risk, as does more traditional, technological innovation. Turning back to professor Dratler’s theory, it is argued that the only risk associated with the development of

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113 Olson, supra note 5, at 228.

114 The development of business methods is firm-specific as they are developed to address specific downfalls in a specific organization. For this reason, with business methods, the free-rider problem almost never arises. See Dreyfuss, supra note 5, at 275 (claiming that business method patents do not provide a solution to the free-rider problem because they “depend in strong ways on the social structure of the integration of the firm and on the firms utilizing them—on compensation schemes, lines of reporting, supervising policies, and other business factors.”)

115 Id.

116 Id. at 229.

117 Id. at 230.

118 Bilski v. Kappos, 130 S. Ct. at 3254.
business methods is market risk, as distinguished from technological risk.\textsuperscript{119} Not only that there is no risk that a business method will be a total failure (in the sense that it always works for its intended purpose), but also the research and development costs that are put in stake when developing such methods are often relatively low.\textsuperscript{120}

Another practical objection to business method patents focuses on their allegedly negative economic consequences. In this context, professor David Olson argues that with business methods, patenting is never efficient because it causes more deadweight loss to society than gain from increased innovation.\textsuperscript{121} According to professor Olson, “when a firm is granted a patent on a method of doing business, however, it can prevent its rivals from using the more efficient method, and make the costs of all of its rivals’ goods relatively more expensive, thus driving up deadweight loss across an industry instead of merely for a particular product.”\textsuperscript{122}

Another way academics describe the negative effect of business methods over innovation relates to the cumulative nature of the business industry. Much like the argument made with respect to software, patents over business methods are considered to impede subsequent innovation in the industry.\textsuperscript{123} This negative effect over innovation is allegedly magnified by the “potential vagueness” of business method patents.\textsuperscript{124} Usually consisting of intangible steps, it is contended that claims to business methods lack clarity “which is essential to

\begin{footnotesize}
\begin{enumerate}
\item Dratler, \textit{supra} note 95, at 874.
\item Pamela Samuelson & Jason Schultz, \textit{supra} note 112, at 113.
\item Olson, \textit{supra} note 5, at 227-228 (suggesting that business methods should be excluded \textit{per se}, except in those rare cases where they cannot be reliably separated into their own subject matter category.)
\item \textit{Id.} at 234.
\item \textit{Bilski v. Kappos}, 130 S. Ct. at 3256 (citing \textit{eBay Inc.}, 547 U.S. at 397 (Kennedy, J., concurring)).
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promote progress.”125 According to this argument, the breadth and potential vagueness of business method claims stimulate the appearance of “patent trolls” - these are “speculative schemers who make it their business to watch the advancing wave of improvement, and gather its foam in the form of patented monopolies, which enable them to lay a heavy tax upon the industry of the country, without contributing anything to the real advancement of the arts.”126

Without opining on the merits of these significant objections to business method patents, this article again refuses to accept a per se rule excluding all business method patents. Acknowledging the fact that business methods may accomplish the same goals associated with more generally accepted patents and encourage individual innovation,127 this article advocates a case-by-case subject matter eligibility analysis. Taking a broad perspective, this article argues that the categorical exclusion of business methods, much like any other strict gatekeeping approach, cannot safeguard successfully the realm of patentable subject matter. While it may prevent the issuance of some unwarranted patents in the field of business, it might as well prevent the issuance of some warranted patents in this field. It definitely cannot prevent the issuance of unwarranted patents in other fields of innovation.

B. MINIMIZING THE ROLE OF SUBJECT MATTER ELIGIBILITY IN DETERMINING PATENTABILITY

An alternative and somewhat opposite approach to the gatekeeping approaches described supra is the one minimizing the role of section 101 in determining patentability, viewing it as a nominal threshold inquiry. Justice Kennedy has well-defined the essence of this broad approach noting that, “the § 101 patent-eligibility inquiry is only a threshold test. Even if an invention

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125 Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., LTD., et al, 535 U.S. 722, 730-731 (2002) (explaining that without clarity regarding the scope of business method patents, it tends to be more costly and time consuming to search through, and to negotiate licenses for, patents on business methods.).


qualifies as a process, machine, manufacture, or composition of matter, in order to receive the Patent Act’s protection the claimed invention must also satisfy ‘the conditions and requirements of this title.’ Those requirements include that the invention be novel, nonobvious, and fully and particularly described.”

This subsection will describe two derivations of this broad subject matter eligibility approach as they appear in the modern literature. Particularly, it will discuss the scope limitation approach to subject matter eligibility and professor Risch’s radical approach, which objects any and all limitations over subject matter eligibility.

1. THE SCOPE LIMITATION APPROACH

The scope limitation approach is nothing like a traditional gatekeeping approach. Rather than viewing section 101 as a gatekeeping requirement that should be decided before everything else, it views subject matter eligibility as a scope limitation requirement that should be applied as a backstop, after all validity doctrines have been exhausted. “Only once an invention is deemed new, nonobvious, described and enabled,” the scope limitation approach asks, “whether there is nonetheless some reason to limit a claim.” Theoretically, under this minimal subject matter approach, many unwarranted inventions could be excluded from patent protection without ever being examined under section 101. Yet, while excluding unwarranted inventions is definitely a desirable outcome, the following section of this article will show that achieving it through the other statutory requirements is practically problematic and economically inefficient.

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129 Life After Bilski, supra note 18.
130 Id. at 1342.
131 Id.
132 Id.
Professors Lemely, Risch, Sichelman and Wagner’s scope limitation approach focuses on interpreting the rule against patenting abstract ideas. Observing that there is no clear distinction between patentable subject matter and unpatentable abstract idea, these professors suggest a new way to understand the common law abstract idea exception. According to their theory, the abstract ideas exception purports “to prevent inventions from claiming their ideas too broadly.” Specifically, they argue that “when patent claims are limited to a specific set of practical applications of an idea, the abstract ideas doctrine both makes the scope of the resulting patent clearer and leaves room for subsequent inventors to improve upon-and patent new applications of-the same basic principle.”

The scope limitation approach correctly contends that traditional gatekeeping approaches engage into a pointless effort to fit inventions into permissible and impermissible categories. Acknowledging that categorical rules may serve to reduce administrative and judicial costs in determining subject matter eligibility, the scope limitation theory nonetheless criticizes their inflexibility, contending, that “they are either over-exclusive or under-exclusive in a costly and haphazard way.” Accordingly, instead of drawing conceptual lines around categories of invention that should be unpatentable, the scope limitation approach suggests a flexible, policy-based test to determine subject matter patentability.

Under the scope limitation approach, claims are permissible when they are commensurate with a practical, real world contribution. In making such a determination, this approach suggests the consideration of several policy-based factors: the generative nature of the new technology (the more limited is the set of possible applications of a claimed invention, the less we worry about awarding ownership over generative building blocks); the nature of the industry in which the invention occurs (allowing overly-broad claims in fields that are more likely to rely on cumulative innovation is more dangerous than in other industries); the speed with which advances are made (because the duration of patent protection is twenty years, the cost of an overbroad patent may be less in a slow-moving industry than in fast-moving one); the fact that a patentee claims a

133 Id. at 1317.
134 Id.
135 Id. at 1326-7.
principle based on one or very few applications (an indication that the claim is likely to encompass unanticipated applications); and the importance of the patentee’s contribution (the more important the patentee’s contribution, the more we should err on the side of allowing broad claims at the margins).  

This article agrees with most of the insights advanced by the scope limitation approach, as much as they concern the application of the abstract ideas exception to subject matter eligibility. If, indeed, the question leading the development of this approach was how should the abstract ideas exception be interpreted, then the solution suggested by the scope limitation approach may be a winner. This article, however, purports to answer a question that is much more preliminary and basic: how should the entire theory of subject matter eligibility be approached? While the scope limitation approach affords some meaningful clues as to the characteristics of the desired subject matter approach, i.e. that it should be one that does not articulate rigid categorical exceptions to patent protection but rather remain flexible and broad, it also unacceptably suggests viewing it as a backstop rather than a gatekeeper. In any event, while the scope limitation approach does not purport to create a comprehensive subject matter eligibility approach, this article wishes to do exactly that.

2. “EVERYTHING IS PATENTABLE”

Another minimal approach to subject matter eligibility, which I wish to address, is professor Risch’s “everything is patentable” approach. Positioned on the edge of the spectrum of subject matter eligibility approaches, right opposite to the traditional gatekeeping approach of categorical exclusions, this approach asserts that an invention that satisfies the Patent Act’s requirements of category, utility, novelty, non-obviousness and specification should be patentable. Objecting all previously developed tests for determining subject matter eligibility as unsupportable statutory interpretations of the Patent Act, Risch’s “everything

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136 Id. at 1339-41.  
137 Risch, supra note 20.
is patentable” approach advocates a rigorous application of the Patent Act’s patentability criteria. Specifically, according to Risch, section 101 requires that a claimed invention “fit into one of the statutory categories: ‘process, machine, manufacture, or composition of matter, or any new and useful improvement thereof.’ While rare, inventions do exist that may fall outside these categories. The issue should not be whether a claim is, for example, a law of nature, but instead whether the claim falls into a statutory category.”

The most revolutionary aspect of this approach is the proposition suggesting that even the common law exceptions to patentable subject matter should be abandoned. To support this radical assertion, Risch argues that judges lack the empirical information necessary to make subject matter policy. Additionally, he argues that when determining subject matter eligibility, the focus must be on the specific case at issue and not on general exceptions originating in previous cases. Finally, Risch contends that judges should not be responsible for legislating patent eligibility beyond the categories defined by Congress. With these insights, Risch proceeds to assume that “maximum social value is obtained by the issuance of only those patents that are justified under the statute.” Finding that allegedly “bright line rules” for determining patentability lack clarity and consistency, he concludes that a rigorous application of the statutory requirements for patentability will increase the benefits of our patent system and decrease the costs.

While this article agrees with the proposition that “like any bright line rule, fixed subject matter rules will lead to both over and under-allowance of bad or good patents respectively,” it does not accept professor Risch’s general “everything is patentable” approach. Notwithstanding the fact that the approach proposed in this article deviates from traditional gatekeeping approaches, it declines to go as far as professor Risch went and desert all non-statutory limitations over subject matter eligibility. In fact, this article argues that clearly-

138 Id. at 594.
139 Id.
140 Id. at 594.
141 Id. at 648 (citing Michael W. Carroll, One for All: The Problem of Uniformity Cost in Intellectual Property Law, 55 AM. U. L. REV. 845, 857 (2006)).
defined; policy-based (and not statutory-based) standards are precisely what the doctrine of subject matter eligibility is missing. Such clear standards are capable of becoming effective “policy levers,” at least as effective as the judicial rules interpreting the statutory requirements for patentability.

III. WHY TO REVIVE SECTION 101’s GATEKEEPING FUNCTION

This part of my article attempts to explain my proposition that the doctrine of subject matter eligibility can be the most efficient statutory mechanism to exclude unwarranted patents. I use the term “can be” because in its current, allegedly incomplete form, the doctrine of subject matter eligibility is a relatively weak gatekeeper. Exclusively depended on unsettled interpretations of the three common law exceptions, it lacks clarity and certainty. Nevertheless, because a great gatekeeping potential is inherent to the doctrine of subject matter eligibility, this article undertakes the challenge of defining two policy-based requirements capable of optimizing this potential. Before introducing these suggested requirements, however, it is instructive to first address a preliminary question: why is it advisable to strengthen section 101’s gatekeeping role?

This section attempts to answer this question, showing that counting solely, or even partly, on the other statutory requirements for patentability to exclude unwarranted patents is problematic for practical, economic and normative reasons.


143 Some commentators suggest that most if not all of the Court’s patentable subject matter precedents could be better understood in terms of other requirements for patent protection such as novelty, non-obviousness, or limitations on claim scope. See Risch, supra note 20; Crouch & Merges, supra note 22, at 1673 (2001); Duffy, supra note 16 (highlighting the Court’s ability to restrict the patent system by using the obviousness doctrine); Osenga, supra note 22, at 1115-18 (arguing that the courts and the Patent Office “may be using § 101 rejections as proxies for other difficult questions of patentability and policy.”). This article focuses mainly on the statutory requirements of novelty and non-obviousness because these are the primary grounds used by patent examiners to reject claimed inventions.
A. THE PRACTICAL ASPECT: PROBLEMS ASSOCIATED WITH RETRIEVING INVALIDATING PRIOR ART

Supposing a clearly defined doctrine of subject matter eligibility, such as the one recommended in this article, section 101 should succeed in excluding inventions unworthy of patent protection where the requirements of novelty and non-obviousness ought to fail due to practical difficulties. Indeed, even when an invention appears patently old and obvious, there is a real problem of retrieving invalidating prior art necessary to execute a novelty or non-obviousness rejection. First of all, patent examiners suffer from deficient access to adequate information about relevant prior art, as evidenced from the following findings of professor Noveck:

“The examiner’s options for searching the prior art are limited. Patent examiners, especially those who are unable to use the Internet, must rely on three computer systems in place at the USPTO: Examiner’s Automated Search Tool (“EAST”), Web-Based Examiner Search Tool (“WEST”), and Foreign Patent Access System (“FPAS”). These databases provide access to prior U.S. patents, foreign patent abstracts, certain pending U.S. applications, and additional proprietary database libraries. The USPTO databases are not exhaustive. While an examiner might be inclined to use Google to look up information online, the use of Internet research is restricted for security reasons, as there is a risk that examiner searching

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145 Patent examination focuses mainly on two inquiries: novelty and non-obviousness. Novelty asks whether the invention is new, while Non-obviousness asks whether the invention is more than an obvious advance over what came before from the perspective of one with ordinary skill in the field of the invention. The availability of relevant “prior art”—the potentially preempting knowledge that existed at the time of the invention— is fundamental to both requirements.

146 Noveck, supra note 23, at 132.
could be tracked. In effect, the examiner is limited to internal sources available at the office.”\textsuperscript{147}

Second, even when relevant prior art is retrieved, patent examiners have depleted ability to apply it effectively. Most patent examiners are inexperienced (fifty-five percent of patent examiners have been employed by the USPTO for fewer than two years, and examiners are not required to possess an advanced degree) and underpaid (earning approximately $55,000 a year while an associate in a Manhattan law firm earns a base salary of $145,000).\textsuperscript{148} Add to this the fact that a patent examiner can spend only 8 to 30 hours on the entire process of patent examination, as well as the fact that there has been a continuous growth in the number of patent applications received by the USPTO in the last two decades (in 1990, the USPTO received 164,558 utility applications, while in 2000, 295,926 utility applications were received, and in 2011 490,226 utility applications were filed),\textsuperscript{149} and you will inevitably conclude that examiners do not have time for an adequate search of relevant prior art.\textsuperscript{150} And indeed, prior art is frequently grounds for finding invalidity of an issued patent during litigation: of the patents found invalid in a 1989-1996 dataset, the majority (51.6\%) were on grounds related to prior art\textsuperscript{151} (either section 102 prior art or section 103 obviousness grounds), suggesting that in many cases not all relevant prior art is being considered during examination of a patent application.\textsuperscript{152}

These concerns are especially noticeable in emerging fields of innovation, such as software, information technology and biotechnology. Indeed, the fact that many software improvements are not researchable at all in the literature bolsters the information deficient. While some improvements may be documented via developer specifications or online FAQs, the source code itself is

\textsuperscript{147} Id. at 135.

\textsuperscript{148} Id. at 132.

\textsuperscript{149} http://www.uspto.gov/web/offices/ac/ido/oeip/taf/us_stat.pdf.


\textsuperscript{152} Id.
almost never released.\textsuperscript{153} Additionally, while patent examiners focus mainly on U.S. patent database in searching for prior art,\textsuperscript{154} in “new” fields of innovation, there are relatively few patents issued as yet. It was found that 60\% cited prior art references in issued software-related patents were from the patent literature, meaning only 40\% of cited prior art was from non-patent literature.\textsuperscript{155} These numbers imply that a substantial amount of relevant (and perhaps invalidating) prior art has not been identified. Moreover, with respect to cutting-edge innovations in the field of biotechnology, an opposite problem of too much information may arise and complicate the examination under the statutory requirements of novelty and non-obviousness (i.e., when patent examiners encounter massive amounts of material from which they need to winnow the relevant and useful prior art).\textsuperscript{156}

Accordingly, from a practical perspective, the statutory requirements related to prior art are incapable of wining all unwarranted patents out of our patent system. Retrieving invalidating prior art is a difficult task, and in many instances even an impossible one. When the one piece of invalidating prior art is not documented in the internal database of the patent office, patent examiners often have no alternative other than to grant an application, even if unworthy of patent protection.

B. THE ECONOMIC ASPECT: EXCLUDING UNWARRANTED PATENTS ON SUBJECT MATTER GROUNDS IS THE CHEAPEST STATUTORY MECHANISM OF EXCLUSION; IT IS ALSO CAPABLE OF DECREASING OVERALL LITIGATION

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\textsuperscript{155} Merges, supra note 5, at 589 (1999).

Economic analysis also suggests that subject matter eligibility is the statutory mechanism having the best potential to exclude unwarranted patents. Apparently, excluding unwarranted patents on subject matter grounds is the cheapest statutory mechanism of exclusion. As a matter of fact, if better tools existed to execute subject matter rejections at the PTO level, overall litigation rates could be reduced noticeably, increasing the efficiency of subject matter eligibility. This section will now turn to explain these novel propositions.

Real world patent litigation practices show that attacking the validity of an issued patent on grounds related to prior art is more expensive than attacking patent validity on grounds of subject matter ineligibility. Indeed, in order to raise a winning validity challenge based on anticipation or non-obviousness a thorough search of invalidating prior art is necessary. Often times, this search will involve several different countries, with documents written in many different languages. Thus, to conduct a successful search for purposes of invalidating an issued patent, honed research skill, expertise in the specific field of invention, search experience and language proficiencies are all required.

It should be noted that a prior art search, executed on behalf of a potential patent applicant during the initial feasibility stage of a product’s development, or at least before preparing a patent application,157 to check whether the claimed invention had been invented before and a validity search, executed during litigation to prove patent invalidity, are two different things, with totally different costs. While the initial prior art search is rather conservative and totally voluntary,158 with estimated costs of $700 to $1000,159 depending upon the complexity of the technology, a validity search is necessarily pedantic, resulting with extremely high expenses. Because every issued patent enjoys the

158 Conducting a prior art search is not a mandatory legal requirement. See http://www.yale.edu/ocr/pfg/guidelines/patent/patentability.html.
159 See http://www.intelprolaw.com/Forum/Forum.cgi?board=whatispatentable;action=display;num=1149652051 See also http://inventivestep.net/2010/04/19/prior-art-searches/, suggesting that a good search takes a couple of weeks to complete and usually costs less than $2,000, often less than $1,000. There are even better deals out there: See, for instance, the Bay Area Intellectual Group, Inc. offering prior art search packages for small individuals (i.e., a small business with < 50 employees, start-up, or individual) for only $250.
presumption of validity,\textsuperscript{160} extra ordinary efforts must be invested in order to locate a prior art reference that is so damaging as to raise the question whether the patent would have been granted if the examiner had considered it.

Plenty of data as to the general costs of patent litigation and the specific costs of discovery exists out there.\textsuperscript{161} While no formal data reveals the exact costs associated with locating the most relevant prior art reference necessary to contest the validity of an issued patent, these costs apparently constitute a noticeable component of the overall discovery costs.

Several patent litigators from prestigious law firms have estimated that these costs should be at minimum $10,000 and up.\textsuperscript{162} Different circumstances, however, may cause these expenses to skyrocket. For instance, it matters who are the defendants- do they represent a major corporation whose business is threatened by a new, patented product? Additionally, it is relevant who are the patent holders- are they a serious company, and did they do the work of registering the patent correctly and thoroughly? Moreover, the complexity of the field of invention, as well as the geographic scope of the search may substantially increase these costs (search that is limited to English language references versus search that encompasses foreign language references). Finally, the motivation to invest great amounts of money on locating an invalidating reference is directly dependent on what is at stake in the litigation, i.e. how big is the market, what is the market share per producer, what are the possible lost profits, etc.

In any event, it is clear that these validity search costs are far from being negligible. It is no surprise, thus, that many external litigation support companies offer a comprehensive validity search service performed by searchers having the technical expertise, search experience and language proficiencies necessary to locate the most relevant prior art references. Take for example, Global Prior Art, Inc.,\textsuperscript{163} which offers comprehensive litigation support to

\textsuperscript{160} See 35 U.S.C. § 282.


\textsuperscript{162} Based on interviews conducted with several practitioners.

\textsuperscript{163} See http://www.globalpriorart.com/expertise. Other similar companies include “A Market Force,” specifying in biotechnology (http://www.amarketforce.com/lifescience Marketable research services.php); CARDINAL
engineering and life science projects, among other research and analysis services. Specifically, it provides: (1) customized search strategies based on the technology and aligned with client’s goals; (2) manual class-based review of US and/or foreign patents and applications; (3) comprehensive coverage of non-patent literature, including conference proceedings, monographs and theses; (3) access to world class libraries and technical holdings; and (4) the closest references containing the targeted claim elements and technology.164

On the other hand, winning an invalidity challenge based on subject matter ineligibility does not seem to involve such complex and expensive research and analysis. This assertion seems quite reasonable under the current state of the doctrine of subject matter eligibility, which at most requires intellectual efforts (in contrast to research and analysis efforts) to creatively interpret the three common law exceptions in such a way that will encompass the allegedly invalid patent.

Note, that this assertion should remain applicable under this article’s proposed additions to the doctrine of subject matter eligibility. As explained henceforth,165 while the proposed additions may seem to require some research and analysis, in fact, the information necessary to satisfy the burden of proving them is the kind of information generally possessed by patentees. Hence, adding the suggested eligibility requirements should not imply extra-ordinary research and analysis expenses over patentees and potential defendants.

Accordingly, it appears that retaining subject matter eligibility as a gatekeeping mechanism is not only practically advisable, but also economically efficient. As this section elaborated, challenging the validity of patents on grounds related to subject matter eligibility is much cheaper than raising validity challenges on grounds related to prior art. Reviving section 101’s gatekeeping function is, thus, economically justified as means of reducing litigation costs.


165 See discussion on pg. 61-2.
Therefore, this article will recommend adding to the three common law exceptions two additional well-defined requirements for subject matter eligibility that are capable of excluding unwarranted patents.

To be clearer, this article does not advocate investing additional resources on patent examination. Instead, it suggests a supplemental set of clear criteria capable of excluding inventions unworthy of patent protection. This article acknowledges professor Lemely’s observation that because the overwhelming majority of patents are never litigated or even licensed, “it is much cheaper for society to make detailed validity determinations in those few cases than to invest additional resources examining patents that will never be heard from again.” Nevertheless, this article contends that it will be economically irrational for the PTO not to address issues of subject matter eligibility when encountering valuable patent applications, if clear and predictable standards for performing such determinations are available.

Finally, supplementing the current doctrine of subject matter eligibility with clear and predictable requirements would enable patent examiners to reject claims suspected of covering impermissible subject matter more easily, instead of leaving the determination of their validity to expensive and lengthy litigation. If indeed unworthy inventions would be excluded during the preliminary prosecution stage, overall litigation will decrease, reducing in turn the general social costs incurred by any kind of litigation.

C. THE NORMATIVE ASPECT: SUBJECT MATTER ELIGIBILITY IS THE ONLY STATUTORY MECHANISM CAPABLE OF EXCLUDING UNWARRANTED PATENTS THAT ARE NONETHELESS NOVEL, NONOBLVIOUS AND ADEQUATELY DESCRIBED

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Some inventions are unworthy of patent protection, albeit their novelty, non-obviousness and adequate disclosure. While most of them seem of doubtful value, some of them are economically important. It is these inventions that are particularly vulnerable to abuse by patent trolls and contribute to the widespread sense that the U.S. patent system is undergoing a breakdown. This article identifies two types of such unworthy inventions: inventions whose development is not dependent on the protection afforded by our patent law, and inventions that lack any intended commercial use. Surprisingly, the diverse literature on subject matter eligibility has never proposed clear criteria to identify unworthy inventions having one of these characteristics on a case-by-case basis. The following section will describe these two types of inventions I refer to as “unworthy” and explain why they contradict the policies underlying our patent system. Specifically, it will show that patents granted over such inventions impose social costs that are higher than their prospected benefits because they unnecessarily violate the rule of free competition and impede future innovation.

Before proceeding to discuss the first type of these unworthy inventions, it is important to note that unworthy inventions may have additional negative characteristics, such as over-breadth and uncertain claim scope. By claiming technologies that are unknown at the time the patent is filed and that might change over time, some unworthy inventions cover a wide area of inventive space, and as a result stifle innovation. Nevertheless, over-breadth and

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169 For example, a method of playing a bowling game (U.S. Patent No. 6,142,880 (filed Nov. 7, 2000)) and an animal toy that is essentially a stick (U.S. Patent No. 6,360,693 (filed Mar. 26, 2002)). See Crazy Patents, http://www.freepatentonline.com/crazy.html for additional examples see

170 Walmsley Graf, supra note 150, at 496.

171 David Olson, in his article, argues that the most efficient patent regime is one that starts by determining initially, on a category-by-category basis, whether classes of inventions should be patentable. Only if it is determined that a class of inventions needs the incentive of the patent grant, Olson suggests to apply the other tests for patentability such as novelty, non-obviousness, and enablement/written description. Olson, supra note 5, at 201-2. Olson’s proposal articulates a traditional gatekeeping approach to subject matter eligibility as it suggests a categorical exclusion of an entire field of inventions. This article, however, addresses the problem of patents issuing over inventions that do not need the incentive of the patent grant totally differently. Specifically, it proposes that such patents should be identified and excluded on a case-by-case basis according to clear and specific criteria.

172 Cohen & Lemley, supra note 153, at 16.

173 Id.
uncertain scope can be theoretically addressed by the abstract ideas exception, or by the statutory requirements of section 112. On the other hand, it is impossible to directly consider the fact that the development of a specific invention was not incentivized by our patent law, or that a particular invention has no intended commercial use, under the current state of the statutory requirements for patentability, notwithstanding the extremely negative effects patents granted over inventions having such characteristics impose on innovation. Novelty, utility, non-obviousness, adequate disclosure and even the common law exceptions to patent eligibility are not directly linked to these characteristics.

It is true that patent laws were created in the first place to incentivize innovation and promote the progress of useful arts. Indeed, it is widely perceived that without patent grants, too little innovation will occur because the rational inventor will not bother to invent knowing that she will not be able to recoup the cost of invention. Nevertheless, innovation independent of patent protection is not a recognizable ground for rejecting a patent application. Similarly, a patent application cannot be simply rejected for lacking any intended commercial use. That is, the statutory requirements for patentability, as we know them today, do not address these characteristics precisely and directly, and for this precise reason, subject matter eligibility is so important. Not only that it is the most practical and economically efficient mechanism to exclude unworthy patents, it is the only statutory mechanism that can potentially exclude such patents.

1. INVENTIONS WHOSE DEVELOPMENT IS NOT DEPENDENT ON THE PATENT ACT’S PECUNIARY INCENTIVES

174 See Life After Bilski, supra note 18, at 1315, suggesting viewing subject matter eligibility as a limitation over claim scope.
175 Eisenberg, supra note 36, at 66.
176 This is not just a simple requirement of utility.
177 U.S. Const. art. I, § 8, cl. 8.
178 Olson, supra note 5, at 83.
179 In its final part, this article will suggest clear criteria to be considered under section 101 in order to fully exploit its gatekeeping potential and exclude unwarranted patents.
What is striking about patents whose development is not dependent on the patent’s Act pecuniary incentives is that they do not comply with the constitutional mandate underlining our whole patent system: They fail to reflect an appropriate balance between the ex post costs of short-term monopoly and the benefits of higher ex ante incentives to innovate.180 With such patents, the decreased competition and increased costs associated with patent monopoly exceed the benefit society gains from increased innovation of new, useful and nonobvious things.181

a. Balancing a Patent’s Costs and Benefits

Understanding the costs incurred by the grant of monopoly rights is rather easy because all sorts of monopoly rights entail obvious costs to society—the so-called deadweight loss of monopoly.182 Monopolies are the exception to the general rule of free competition. They provide the monopolist with the exclusive right to sell a particular good or service for a monopoly price. This price is de facto higher than the alternative competitive price.183 Conceivably, many individuals who value the good at greater than its marginal cost of production, so that it is socially desirable for them to have it, would be unable to obtain it, if their value of the good is below the monopoly price.184 As a result, some of the surplus that would exist in a competitive market is lost. This lost surplus, referred to as the “deadweight loss” from monopoly, is a source of inefficiency.185

181 Olson, supra note 5, at 193.
182 Id. at 193; see also Cohen & Lemley, supra note 53, at 50; Peter Eckersley, Virtual Markets for Virtual Goods: The Mirror Image of Digital Copyright, 18 HARV. J.L. & TECH. 85, 118 n.111 (2004) (defining deadweight loss as “any cost to society which could be relieved without harming anyone.”).
183 Olson, supra note 5, at 197.
185 Olson, supra note 5, at 197.
A patent, as a type of monopoly, affords its owner with the sole right to exclude others from making, selling, using, or licensing the underlying invention. Anyone else who makes, sells, uses, or licenses the invention or an equivalent thereof—even if that person invented it independently—infringes the patent and can be enjoined from practicing the patent and required to pay damages. Under the regime of patent law, the corresponding deadweight loss may be quite significant, especially when the gap between the marginal cost and the monopoly price charged is rather large, as happens in the pharmaceutical and software industries.

To justify the grant of patent rights, these monopoly costs must be outweighed by the social benefit of increased innovation. Yet, an inventor will choose to invent only to the extent that she can recoup greater returns from her future invention than from other investments of her time and talent. The returns from inventing are the revenues an inventor can earn from selling, licensing, or using her invention. Without the right to exclude rivals from entering the market for her invention, the inventor will often not be able to recoup her costs of invention because competitors will be able to copy her invention and undersell it, as they have no costs of invention to recoup. Thus, the rational inventor will not expend resources to invent in a competitive market when she cannot recover the cost of her investment in inventing. Economics refer to this problem as the “public good problem” and suggest solving it by subsidizing the production of under-produced goods. Appropriately, patent law subsidizes innovation through the grant of patents, which afford inventors the exclusive right to control their invention for twenty years. In this way, our patent system ensures the constant progress of science and useful arts.

b. Breaking the Balance- When Other Factors Sufficiently Incentivize Innovation

186 Id. at 193.
187 Calandrillo, supra note 184, at 304.
188 Olson, supra note 5, at 195-6.
189 Id. at 196.
190 Id. at 197.
When patents fail to reflect an appropriate balance between the *ex post* costs of short-term monopoly and the benefits of higher *ex ante* incentives to innovate they are unworthy. This occurs precisely when a prospected invention is not subject to a public goods problem because other factors exist that adequately incentivize its development.\(^{191}\) One such factor could be the inventor’s personal benefit from the invention.\(^{192}\) When the inventor intends to consume the invention herself she has a private incentive to innovate, unrelated to the external incentive afforded by the grant of a patent.\(^{193}\) Consider, for instance, a company that develops a new marketing technique that increases its profits. As a commercial entity, the company’s underlining goal is to maximize its revenue. Since the newly developed marketing technique is directly linked to this goal, arguably, the company would have developed it anyhow, irrespective of its potential option of securing a patent. Indeed, in a highly competitive market, a company that offers even a slight drop in price or improvement in service derives large gains in extra sales, and thus large gains in revenue.\(^{194}\) These, alone, may be sufficient to incentivize such self-consuming innovation.\(^{195}\)

Another important factor that can possibly incentivize innovation is the availability of other legal protections, such as trade secret law. To achieve a trade secret status, the inventor must implement specific confidentiality and security requirements.\(^{196}\) Typically, when availing trade secret law, a firm makes use of employee contracts that obligate its employees to conceal confidential information from rivals, giving the firm exclusive use.\(^{197}\) The firm also implies non-compete agreements to prevent employees from forwarding such trade secrets to competitors after their employment is terminated. Consequently, the

\(^{191}\) *Id.* at 203.

\(^{192}\) Calandrillo, *supra* note 184, at 305; *See also* Lloyd Weinreb, *Copyright For Functional Expression*, 111 Harv. L. Rev. 1149, 1226 (1998).


\(^{194}\) Olson, *supra* note 5, at 228.

\(^{195}\) Devlin, *supra* note 193, at 930-931.


\(^{197}\) Olson, *supra* note 5, at 229.
firm obtains semi-monopoly protection, without any foray into the patent application process.\textsuperscript{198} When applicable, trade secret law may be preferable to patent law: First, it allows parties to create their own level of protection to each trade secret, according to their internal analysis of their invention costs and benefits. Second, it is not depended on an external examination process, such as the one conducted by patent examiners at the PTO, saving both the time and the money ordinarily invested in the preparation and prosecution of a common patent application.\textsuperscript{199}

The alternative protection afforded by trade secret law becomes relevant especially in instances where reverse engineering the invention is highly complex. With self-consuming inventions, for example, the possibility of reverse engineering is rather difficult because such inventions are initially designed to benefit the inventor. In particular, such inventions are typically invisible to rivals, thus the cost of reverse engineering them is higher than standard inventions. Competitors cannot simply purchase the invention, because the invention is not to be found in stores. To reverse engineer the invention, competitors need inside information on how the invention operates. Yet, obtaining such information is quite a difficult task, in light of non-compete agreements and legal sanctions that discourage this kind of behavior.\textsuperscript{200}

Consider, for instance, that Pampers develops a new method for manufacturing diapers, which drastically decreases its production costs. For Pampers, it is both cheaper and faster to protect its new method under the regime of trade secret law. Hence, rather than applying for a patent and possibly obtaining a limited monopoly over its new method, Pampers can insure all its employees keep the new manufacturing method secret and enjoy the benefits of trade secret law for an unlimited duration.

A different possible factor that may incentivize innovation could be the social incentive of reputation. This type of incentive is mostly relevant to academic settings, where professional success is evaluated according to the degree of

\textsuperscript{198} Id.
\textsuperscript{199} Id. at 229-230.
\textsuperscript{200} Devlin, supra note 193, at 930-931.
inventiveness. Some professors and researchers engage in innovation, irrespective of their future possibility to obtain patent rights, because the need to publish novel insights is a prerequisite to achieving success and tenure. Nonetheless, it is quite difficult to draw a clear line between those academics that are solely driven by the reward of publication and recognition, and those who are also motivated by patent law’s pecuniary reward. This is especially true if we take into consideration the organization with which the academic is affiliated. The possibility of securing future patents may very well incentivize the organization to support the academic in the first place. Thus, this article will not regard reputation as a separate available incentive to innovation.

The most influential factor that incentivizes innovation is low research and development costs. Recall, that an inventor will choose to invent only to the extent that she can recoup greater returns from her future invention than from other investments of her time and talent. When the process of inventing involves relatively low monetary expenses, the inventor is likely to invent, regardless of the pecuniary incentive embedded in the right to exclude rivals from entering the market for her invention. With no substantial need to recoup her costs of invention, the inventor will invent, so long as the prospected invention is anticipated to increase her personal utility. Consider again the example of Pampers’ new method of manufacturing diapers. If Pampers developed this method in its normal course of business, to minimize its production costs, without spending enormous amounts of money in terms of time, research and development, conceivably Pampers does not need patent law to compensate its innovators for their labor, toil and expenses.

To sum up, when alternative incentives to develop a specific invention are adequately available, it is less likely that inventors will rely on patent law’s pecuniary incentive when electing to innovate. The possibility of self-consuming the invention, the availability of alternative protection regimes and relatively low research and development costs are sufficient to incentivize particular

201 Id. at 925-27.
203 Seymour v. Osborne, 78 U.S. 516, 533-544 (1871).
inventions. Since no “public goods” problem actually exits with respect to such inventions, our patent system must not violate the rule of free competition and refrain from subsidizing the inventors through the grant of patent rights. Otherwise, the ex post costs of short-term monopoly will improperly exceed the benefits of higher ex ante incentives to innovate, causing overall inefficiency.

2. **PATENTS WITH NO PROSPECTIVE COMMERCIALIZATION**

The second type of unwarranted patents this article will address concerns patents that lack any intended commercial use in the sense that no one actually makes an economically beneficial use of them. The worst of these are those that are sought solely for the purpose of initiating infringement lawsuits and extorting licensing fees from competitors.\(^\text{204}\) Bringing no innovation to the market, producing no beneficial end product, having no realistic public demand, and in some circumstances, diverging investment from research and development to potentially unwarranted licensing fees or litigation, these bad patents fail to comply with the constitutional mandate, principally allowing the grant of monopoly rights only to those inventions and discoveries that promote the progress of science and useful arts.

This section will show that subject matter eligibility can succeed in excluding these unwarranted patents where the other statutory requirements for patentability fail. In particular, it will demonstrate that patents having no intended commercial use may nonetheless comply with the current statutory requirements for patentability, specifically the requirement of utility incorporated in section 101. Yet, since they impede subsequent innovation and interfere with the progress of science it is vital to filter them out of our patent system at the early stage possible. Demanding proof of “intended commercial use” as a prerequisite for subject matter eligibility is hence suggested as a practical and efficient mechanism to improve patent quality and strengthen section 101’s gatekeeping function.

\(^{204}\) Olson, supra note 5, at 189. These are secured by entities known as “patent trolls.” I will address their tactics henceforth.
a. Why Should We Exclude Patents Having No Intended Commercial Use?

Again, patents exist to promote the progress of science and useful arts. Although they unavoidably block subsequent dependent innovation during the limited time of exclusiveness granted to their owners, in the long run, they incentivize innovation and increase public welfare. At this point, it is clear why innovation that is not steered by the incentives afforded by our patent system should be considered patent ineligible. This section’s attention will thus focus on elucidating why innovation having no potential of increasing overall public welfare should be also deemed ineligible for patent protection.

There are several reasons why patents having no intended commercial use decrease public welfare. First, such patents impose unwarranted burdens on third-party commercializers who might exploit the invention to the public’s benefit. Because the technology underlying the invention is patented, future researchers are de facto estopped from discovering new beneficial uses of the invention. Whether or not the patent will ultimately become commercially useful is contingent solely upon the original inventor, who may be economically inefficient. Research to find a new beneficial use for the invention might consequently stop and the benefits of the invention may never be discovered. Yet, if patent laws were to require proof of prospected commercial use prior to granting patent protection, the invention’s evolvement into a commercially

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205 U.S. CONST. art. I, § 8, cl. 8.
207 See the discussion hitherto.
208 Risch, Reinventing Usefulness, supra note 206, at 1224.
beneficial product would be ensured and the public’s overall welfare would incline.\textsuperscript{210}

Indeed, were costly and uncertain commercialization efforts protected by the resulting patent, inventors would be encouraged to develop their inventions into a beneficial end product. While such efforts would not be patentable in themselves, they would be mandatory to obtain a patent. In effect, they would be considered “experimental use,” \textsuperscript{211} and thus would not be capable of invalidating the patent when done before the patent filing.\textsuperscript{212} Moreover, since patentees would be motivated to file their patent applications after a longer period of development, the term of patent protection would become longer, allowing inventors to fully commercialize their patents.\textsuperscript{213}

Second, affording patent protection irrespective of an invention’s prospected commercial utility is inefficient for another intertwined reason. Absent commercial utility, there could be no real consumer demand to a patented product. As a result, the social costs inevitably imposed on the public from the grant of monopoly rights,\textsuperscript{214} i.e. the social costs imposed by the examination procedure of patent applications, outweigh the prospected social benefits of the invention. When the original inventor is incapable of further developing her invention into a final beneficial product for which the public is willing to pay a price that is higher from the inventor’s marginal cost of production, no innovation capable of increasing public welfare is ultimately brought to the market.

Consider, for example, the patent issued for a “Dining Table Having Integral Dishwasher.”\textsuperscript{215} When presenting this example in his article “Reinventing Usefulness,” professor Risch explains that, “it would likely be difficult to show

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\item \textsuperscript{210} See Christopher A. Cotropia, The Folly of Early Filing in Patent Law, 61 HASTINGS L.J. 65, 75, 76 (2009) (“If patent law required a use of a certain commercial or social worth, an inventor would need to take time to establish that her invention provides this level of benefit before filing.”).
\item \textsuperscript{211} Risch, Reinventing Usefulness, supra note 206, at 1247.
\item \textsuperscript{212} In re Smith, 714 F.2d 1127, 1137 (Fed. Cir. 1983) (explaining that carpet fresh patent was invalid due to public market testing).
\item \textsuperscript{213} Risch, Reinventing Usefulness, supra note 206, at 1248.
\item \textsuperscript{214} See the “deadweight lost” discussed supra.
\item \textsuperscript{215} U.S. Patent No. 5,687,752 (filed Nov. 15, 1995).
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demand for the table. Aside from the basic shortcoming that nobody wants such an apparently silly invention are the costs associated with actually installing the table. Not only would the dishwasher be more expensive than under-counter dishwashers due to materials, but it would also require both plumbing and power in the floor at the location of the table, which would significantly limit acceptance. While market demand may sometimes be unpredictable, the threshold is low enough that marginally commercial inventions should pass muster. The dishwasher likely would not, however, absent some evidence to the contrary.”

Granting patents over silly inventions such as the dining table/dishwasher does not increase public welfare. Since an invention’s usefulness indicates social welfare, when an invention is useless, society reaps no benefit. Nonetheless, while the exclusion of silly patents may represent a desired ancillary outcome, it is not the core purpose of requiring proof of prospected commercial utility. After all, as silly as they might be, such patents hardly if ever block subsequent innovation or impede the progress of science. This is especially true if we take into account the fact that a relatively small percentage of patents are ever licensed or litigated. As noted formerly, this article is concerned about patents that are not only bad, but also valuable. Silly patents, however, are senseless, not valuable. In any event, the example of the dining table/dishwasher remains an important demonstrative tool of the inefficiency caused by the issuance of patents having no real consumer demand.

Third, issuing patents over inventions lacking any prospective commercial use imposes heavy barriers on “component-driven industries,” notably information technology ("IT"), which negatively effects public welfare. Patenting mere components (and not end products) that are crucial for the

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216 Risch, Reinventing Usefulness, supra note 206, at 1195.
217 For example, a method “for exercising curious animals, especially pet cats” with a laser pointer (U.S. Patent No. 6,701,872 (filed Oct. 30, 2002)), or “date formatting and sorting for dates spanning the turn of the century” (U.S. Patent No. 5,806,063 (filed Sep. 8, 1998). See http://www.patentlysilly.com/ for more examples of silly patents.
219 Lemely, Rational Ignorance, supra note 166, at 1.
development of other end products and demanding un-proportional licensing fees for the permission to exploit them is an undesired tactic carried out by entities often referred to as “patent trolls.”\textsuperscript{221} When a single product is built from thousands of different patented pieces, its developers are vulnerable to royalty demands and injunction threats coming from numerous patent holders.\textsuperscript{222} The threat that the patent holders will obtain an injunction that will force the downstream producer to pull its product from the market can greatly affect licensing negotiations, especially in cases where the patents cover small components of a complex, profitable, and popular product.\textsuperscript{223} When the defendant has already invested heavily to design, manufacture, market, and sell the product with the allegedly infringing features, these threats involve a strong element of holdup, enabling patent holders to negotiate royalties far in excess of the patents’ real economic contribution.\textsuperscript{224}

Consider, for instance, Intel, that must aggregate thousands of different inventions into one semiconductor chip. Obviously, Intel is vulnerable to patent trolling by any one of the thousands of inventors.\textsuperscript{225} The inventors of the different patented components, the patent trolls in this scenario, can capture not just the value of what they contributed to the semiconductor chip, but also a

\textsuperscript{221} The term patent troll has been attributed to Peter Detkin when he was assistant counsel at Intel. Detkin defined a patent troll as “somebody who tries to make a lot of money off a patent that they are not practicing and have no intention of practicing and in most cases never practiced.” Brenda Sandburg, You May Not Have a Choice. Trolling for Dollars, RECORDER, July 30, 2001, available at http://www.phonetel.com/pdfs/LWTrolls.pdf. Some prefer to refer to this negative behavior as patent “hold up.” See Mark A. Lemley, Are Universities Patent Trolls?, supra note 220, at 613.

\textsuperscript{222} The literature often refers to these situations as “royalty stacking.” Mark A. Lemley & Carl Shapiro, Patent Holdup and Royalty Stacking, 85 Texas Law Review 1991,1992-3 (2007) (explaining that, “the term ‘royalty stacking’ reflects the fact that, from the perspective of the firm making the product in question, all of the different claims for royalties must be added or ‘stacked’ together to determine the total royalty burden borne by the product if the firm is to sell that product free of patent litigation. As a matter of simple arithmetic, royalty stacking magnifies the problems associated with injunction threats and holdup, and greatly so if many patents read on the same product.”)

\textsuperscript{223} Id.

\textsuperscript{224} Id. at 1993.

\textsuperscript{225} Mark A. Lemley, Are Universities Patent Trolls?, supra note 220, at 613 (explaining that, “patent owners in those component industries can capture far more than the intrinsic value of their invention, because under long- standing patent law patent owners have had the right not just to sue and get paid the percentage of the value contributed by their invention but to enjoin the sale of Intel’s entire chip until it can design a new chip that avoids infringing that patent, something that might take years and require investing billions of dollars in a new fab.”).
disproportionate share of Intel’s product.\textsuperscript{226} Again, patent owners cannot just sue and get paid the percentage of the value contributed by their invention but they can also enjoin the sale of Intel’s entire chip, at least until it can design a new chip that avoids infringing that patent.\textsuperscript{227} Needless to say that this might take years and require investing billions of dollars.\textsuperscript{228}

However, if, prior to obtaining patent protection, components’ inventors would be required to show that the cost of the component would not increase the price of the end product so much as to make it non-competitive, component-driven industries could function more efficiently.\textsuperscript{229} Released from unproportional royalty demands and overwhelming injunction threats, their marginal costs of production could be drastically decreased, allowing them to lower their supply price. Obviously, the overall social welfare would grow, if consumers were required to pay less for their desired goods.


Even though patents having no intended commercial use decrease public welfare, under the current laws governing the statutory requirements for patentability, a patent may issue even if its benefits do not “supersede all other inventions now in practice,”\textsuperscript{230} and even if it is not commercially useful at all.\textsuperscript{231} Indeed, while an invention must promise some public benefit, it need not point to any commercial utility, such as an inventor’s readiness to distribute the patented product or proof that someone might actually want to buy the

\textsuperscript{226} Lemely & Shapiro, \textit{supra} note 222, at 2008.
\textsuperscript{228} Mark A. Lemley, \textit{Are Universities Patent Trolls?}, \textit{supra} note 220, at 613.
\textsuperscript{229} Risch, \textit{Reinventing Usefulness}, \textit{supra} note 206, at 1242.
\textsuperscript{230} Bedford v. Hunt, 3 F. Cas. 37, 37 (C.C.D. Mass. 1817); see also Juicy Whip, Inc. v. Orange Bang, Inc., 185 F.3d 1364, 1367 (Fed. Cir. 1999).
\textsuperscript{231} Risch, \textit{A Surprisingly Useful Requirement}, \textit{supra} note 218, at 67. This approach is often referred to as the “laissez-faire approach” to commercially viable innovation.
product. While patent law provides the inventor with monopoly rights to exclude others from using, selling, making, or practicing the invention, it does not impose a parallel obligation to do the same. In fact, all that is required under section 101’s utility requirement is that an invention be operable and practical. If an application clears these low utility hurdles, it will be granted a patent.

Operable usefulness requires that a patented invention achieve some intended result. Un-operable inventions include inventions that violate a law of nature, i.e. perpetual-motion machines, inventions that could possibly work, but that someone familiar with the subject matter would view as incredible, i.e. untested pharmaceuticals, and inventions that cannot be implemented by following the patent’s teachings, i.e. when the inventor leaves details out of the patent specification.

Practical utility requires that inventions have some currently available specific and substantial use to be patentable. When a patent application merely speculates that an invention might be useful in some general way, the invention lacks specific utility. Also, an invention that provides no immediate benefit to the public, such as a research tool, depends on further research to identify a real-world application and therefore, lacks substantial utility. Finally, section 112 is also relevant to the requirement of practical utility because

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232 Id., at 63.
234 Noveck, supra note 23, at 131.
235 Risch, A Surprisingly Useful Requirement, supra note 218, at 66; Risch, Reinventing Usefulness, supra note 206, at 1200.
236 E.g., Newman v. Quigg, 877 F.2d 1575, 1577 (Fed. Cir. 1989); U.S. PATENT & TRADEMARK OFFICE, MANUAL OF PATENT EXAMINING PROCEDURE § 706.03(a)(II) (8th ed. rev. 2010), available at http://www.uspto.gov/web/offices/pac/mep/mpep_e8r6_0700.pdf (“A rejection on the ground of lack of utility includes the more specific grounds of inoperativeness, involving perpetual motion.”).
238 Id. at 66; Brenner v. Manson, 383 U.S. 519, 534-35 (1966) (“The basic quid pro quo contemplated by the Constitution and the Congress for granting a patent monopoly is the benefit derived by the public from an invention with substantial utility. Unless and until a process is refined and developed to this point—where specific benefit exists in currently available form—there is insufficient justification for permitting an applicant to engross what may prove to be a broad field.”).
239 Risch, A surprisingly useful requirement, supra note 218, at 66.
it requires inventors to disclose how to use an invention.\textsuperscript{240} Without practical utility, an inventor cannot comply with section 112’s “how to use” requirement.\textsuperscript{241}

While practical and operable utility might require the potential for commercial usefulness in some cases, they are not effective substitutes because they do not require a real likelihood that consumers will actually pay for the invention. Because no patentability requirement effectively regulates the commercial utility of inventions, it is no surprise that commercially useless patents constantly issue.\textsuperscript{242} Accordingly, the next and last part of this article will suggest requiring proof of prospected commercial use as an additional prerequisite of subject matter eligibility.

Even though other scholars have previously suggested considering a patent’s prospective utility\textsuperscript{243} or commercial utility\textsuperscript{244} when determining patentability, none of them has proposed to encompass this requirement under subject matter eligibility.\textsuperscript{245} It is this article’s view, however, that incorporating the requirement of proof of intended commercial use under subject matter eligibility, and not under the requirement of utility, is more appropriate. Subject matter eligibility protects the gates of patentability from patent applications that violate the basic policies underlining our patent system, and is thus the most appropriate mechanism to exclude patents having no potential of increasing public welfare.

While incorporating the requirement of proof of intended commercial use under the requirement of utility may achieve similar results, it nonetheless,

\begin{itemize}
\item \textsuperscript{240} 35 U.S.C. § 112.
\item \textsuperscript{241} Risch, \textit{A Surprisingly Useful Requirement}, supra note 218, at 67.
\item \textsuperscript{242} Risch, \textit{Reinventing Usefulness}, supra note 206, at 1195.
\item \textsuperscript{243} See Nathan Machin, \textit{Prospective Utility: A New Interpretation of the Utility Requirement of Section 101 of the Patent Act}, 87 Cal L. Rev. 421 (1999) (proposing a prospective utility doctrine that interprets useful as meaning having utility at present, or having a reasonable chance of being reasonably useful in the foreseeable future).
\item \textsuperscript{244} Risch, \textit{Reinventing Usefulness}, supra note 206, at 1240 (proposing a test that would find commercial utility present with sufficient evidence to convince a person with skill in the art that a) there is a market for the invention, and that b) the invention can be manufactured at a cost sufficient to fulfill market demand.)
\item \textsuperscript{245} But see Risch, \textit{A Surprisingly Useful Requirement}, supra note 218 (suggesting that considering an invention’s usefulness can help resolve novelty, obviousness, subject matter, enablement, claim scope, and damages questions).
\end{itemize}
appears inapt. The statutory requirement of utility is concerned about the practical aspects of utility, much like the statutory requirements of novelty, non-obviousness and adequate disclosure that concern the practical requirements of newness, inventiveness and clarity. While subject matter eligibility also addresses newness, inventiveness and clarity, it does so from a normative, philosophical aspect.

In particular, it calls for the exclusion of laws of nature, not just because they are prior art, but especially because they are crucial investigative tools necessary to enable further innovation. Similarly, subject matter eligibility calls to exclude abstract ideas not only because their boundaries are unclear, but also because unapplied ideas are ought to remain in the public domain. Likewise, subject matter eligibility can exclude patents lacking any intended commercial use, not only because they are not practically marketable, but primarily because they do not benefit the public.

IV. RECOMMENDATIONS

The final part of this article will present two eligibility requirements the author suggests incorporating under the current doctrine of subject matter eligibility. As probably and justifiably expected, these requirements specifically address the two characteristics of unwarranted patents this article discussed in length earlier: patents whose development is not depended on the incentives afforded by the Patent Act and patents that lack any intended commercial use. After defining each of these two supplemental requirements, this section will elucidate how they address the various problems caused by granting such unwarranted patents. Subsequently, it will address the benefits and the possible downfalls of these proposed requirements.

A. REQUIREMENT NUMBER 1: A showing sufficient to convince a person having ordinary skill in the art, that the invention would not have been developed “but for” the incentives afforded by the Patent Act.
The first requirement this article suggests incorporating under the current doctrine of subject matter eligibility is a showing sufficient to convince a person having ordinary skill in the art, that the invention would not have been developed “but for” the incentives afforded by the Patent Act. Proof of the following should count in favor of a determination that the applicant has successfully satisfied his burden of proof:

1. Proof of high research and development costs should count in favor of a determination that the applicant has successfully satisfied his burden of proof. Recall, that an inventor will choose to invent only to the extent that she can recoup greater returns from her future invention than from other investments of her time and talent. When the process of inventing involves relatively low monetary expenses, the inventor is likely to invent, regardless of the pecuniary incentives embedded in the right to exclude rivals from entering the market for her invention. Consider again the example of Pampers’ new method of manufacturing diapers discussed earlier. If Pampers developed this method in its normal course of business, to minimize its production costs, without spending enormous amounts of money in terms of time, research and development, conceivably Pampers does not need patent laws to compensate its innovators for their labor, toil and expenses.246

2. Proof that the inventor did not engage into innovation, intending to consume the invention herself should count in favor of a determination that the applicant has successfully satisfied her burden of proof. When the inventor invents in order to gain an internal benefit from the invention, she has an isolated incentive to innovate, unrelated to the external incentive afforded by the grant of a patent. Take for example a company that develops a new marketing technique that increases its profits. As a commercial entity, the company’s underlining goal is to maximize its revenue. Since the newly developed marketing technique is directly linked to this goal, arguably, the company would have developed it anyhow, irrespective of its potential option of securing a patent.

Note, that this factor focuses on the actual inventor and not on the patent owner in order to prevent acts of *ex post* manipulation. Since the rights conveyed by a patent can be freely assigned or licensed, when the validity of an issued patent is subject to *ex post* judicial review, the real nexus between the inventor and the invention could be easily concealed if this factor had focused on the patent owner, rather than on the real inventor.

3. Proof that other legal protections, such as trade secret law, are not available to protect the invention should count in favor of a determination that the applicant has successfully satisfied his burden. This factor would be mostly applicable in instances where reverse engineering the invention is highly complex. Accordingly, the patent examiner who reviews the patent application (or the judge who performs an *ex post* review) should examine the possibility of reverse engineering the invention, keeping in mind that reverse engineering of self-consuming inventions is rather difficult. Recall, that a self-consuming invention is typically invisible to rivals, thus competitors cannot simply purchase and deconstruct it. To reverse engineer such an invention, competitors must obtain inside information on how the invention operates. Yet, obtaining such information is quite a difficult task, in light of non-compete agreements and legal sanctions that discourage this kind of behavior.\(^\text{247}\)

When examining a patent application (or an issued patent) pursuant to the above factors, patent examiners and judges should bare in mind that none of them dominate. This article promotes a common law, case-by-case eligibility analysis. While in some cases, the costs of developing an invention could be strikingly low; in other cases the availability of alternative legal protections would be more influential. Whatever factor governs, the key to performing a correct analysis under this supplemental subject matter eligibility requirement is flexibility. All factors should be weighted, yet the final decision should be based on the factor domineering a given case.

1. **THE BENEFITS OF REQUIREMENT NUMBER 1**

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\(^{247}\) Devlin, *supra* note 193, at 930-931.
Requiring proof that the claimed invention would not have been developed but for the incentives provided by the Patent Act has manifold benefits. First, by affording patent protection only to those inventions that would have been otherwise subject to a public good problem, the deadweight loss to society could be reduced.\textsuperscript{248} When monopoly rights are granted regardless of whether a specific innovation was initially depended on their incentives, society suffers from higher prices on patented goods, fewer numbers of consumers are able to purchase the patented goods, and the gross domestic product decreases through deadweight loss.\textsuperscript{249} Nonetheless, if patents are granted only in those specific instances where the patentee has no internal benefit from inventing, where other legal forms of IP protection are not available, and where the patentee can actually show substantial investment of time and money that must be recouped, our patent system will achieve its intended purpose of encouraging innovation and increasing public welfare.

Second, adding such a practical requirement to the doctrine of subject matter eligibility will presumably decrease the numbers of both patent applications and issued patents.\textsuperscript{250} This outcome alone is beneficial for several reasons: Fewer patent applications mean less administrative costs. If inventors would despair patent applications assuming they cannot overcome their burden of proving they were actually incentivized by the Patent Act when engaging into inventing, the backload of pending patent applications could be reduced. Consequently, patent examiners would be able to devote more time to patent applications covering inventions that might be actually worthy of patent protection.

Additionally, since patents inevitably block subsequent innovation during the limited duration of exclusiveness granted to their owners, fewer patents enhance free competition and expand public domain. With less constrains over the

\textsuperscript{248} Olson, supra note 5, at 193; \textit{see also} Cohen & Lemley, supra note 153, at 50; \textit{see also} Eckersley, \textit{supra} note 182, at 118 n.111 (defining deadweight loss as “any cost to society which could be relieved without harming anyone”).\textsuperscript{249} Olson, supra note 5, at 183.\textsuperscript{250} \textit{See} Cotropia, supra note 210, at 124 (arguing that greater resource investment prior to examination reduces the number of conceived ideas that turn into examined patent applications).
exploitation of scientific knowledge, more building blocks could become available to generate further progress and innovation. Finally, fewer unwarranted patents will inevitably decrease overall litigation. By requiring proof that the invention would not have been developed but for the incentives afforded by the patent laws, more inventions would inevitably fall into the gray area of suspected eligibility. Unwarranted inventions could be excluded during the initial prosecution stage, consequently sparing subsequent litigation over invalidity issues.

Third, requiring patent applicants to prove they would not have developed their invention but for the pecuniary incentive afforded by the Patent Act would ensure inventors avail other sources of legal protection, when such sources are essentially available. As noted earlier, this should benefit inventors who invent self-consuming goods/services. As reverse engineering such inventions is rather complex, trade secret law should be presumably more effective in protecting them. Inventors could select their desired degree of protection and enjoy unlimited protection. While they might be required to invest additional resources on drafting and enforcing secrecy contracts with their employees, they would in turn avoid the high expenses associated with filing and enforcing a patent.

B. REQUIREMENT NUMBER 2: A showing sufficient to convince a businessman that, a) there is a market for the invention, and that b) the invention can be manufactured at a cost sufficient to fulfill market demand.

The second requirement this article suggests incorporating under the current doctrine of subject matter eligibility is almost similar to professor Risch’s double-folded requirement for establishing commercial utility: First, the applicant must show that there is a market for her invention. Second, the applicant must show

251 Devlin, supra note 193, at 898.
253 Risch, Reinventing Usefulness, supra note 206, at 1240-1.
that the invention can be manufactured at a cost sufficient to fulfill market demand. Note, that both of these are examined as to the filing date of the application and both of them concentrate on expectations.\textsuperscript{254} The applicant is, therefore, not required to show actual production and sale of the invention. Otherwise, the on-sale and public-use bars,\textsuperscript{255} which deny patents covering inventions put to use more than a year prior to filing, would constantly repudiate patentability.\textsuperscript{256} Accordingly, all that is required is a sufficient showing of prospective commercialization of the claimed invention.

Contrary, however, to professor Risch’s dual requirement, this article proposes that during the \textit{ex ante} review process of patent applications, a businessman and not a person having ordinary skill in the art, should evaluate the submitted evidence. Indeed, “the most sophisticated search tools, and the clearest applications and standards are unavailing if the USPTO does not hire, train, and retain talented, dedicated employees.”\textsuperscript{257} A qualified businessman, for purposes of evaluating patent eligibility under the recommended requirement, should be one holding an MBA degree. It is the author’s view, that such a businessman, working exclusively for the PTO, and consequently, bounded by the same confidentiality rules that apply to all PTO’s employees,\textsuperscript{258} is better positioned to make knowledgeable determinations regarding prospective commercialization than a person having ordinary skill in the art.

When elaborating on this double-folded requirement, professor Risch explains:

“The first factor seems straightforward: in order to be commercially useful, some group of people must want to purchase it. The primary doctrinal oddity is that a person having skill in the art of the invention

\textsuperscript{254} Id. at 1241.
\textsuperscript{255} 35 U.S.C § 102.
\textsuperscript{256} Risch, Reinventing Usefulness, supra note 206, at 1245.
\textsuperscript{258} See 35 U.S.C § 122 (requiring all USPTO employees to preserve pending applications for patents in confidence until they are either published or patented) and 18 U.S.C § 2071 (imposing different sanctions, such as suspension, removal, and even criminal penalties, over violations of the confidentiality requirement during the examination process).
will not necessarily be an economist or some other specialist with sufficient information to assess market demand. As a result, the test would likely be applied as a determination a skilled artisan would make with the benefit of information from those who know about market demand . . .

The second factor constrains the result somewhat, by only allowing a finding of commercial utility where there is evidence that near-term market demand can be satisfied. In other words, the factor bars inventions that will remain so expensive to reproduce for such a long period of time that many who might want to purchase the invention are unable to obtain it.”

When applying the dual requirement of prospective commercialization, an objective perspective should be adopted. Essentially, the evidence presented by the patent applicant should show “sufficient profit expectations by a reasonable producer to justify recovery of fixed costs and market demand of more than a handful of people.” While reaching a final determination may be difficult, particularly when needing to decide whether enough transactions are expected to satisfy the two prongs of the requirement, it is not more difficult than judging evidence under other flexible legal standards. Since this article promotes a lenient gatekeeping approach, it does not suggest any easy-to-apply bright line rules to determine sufficient prospective commercialization. Instead, it proposes that businessmen and judges who are well trained in applying different legal standards undertake the task of applying this two prongs requirement on a case-by-case basis.

1. THE BENEFITS OF REQUIREMENT NUMBER 2

By requiring proof of prospective commercialization, inventions that fail to benefit the public could be excluded from our patent system at the initial

259 Risch, Reinventing Usefulness, supra note 206, at 1241-2.
260 Id. at 1243.
examination stage of subject matter eligibility. In particular, these two intertwined prerequisites for subject matter eligibility should cure the illness spread by such unwarranted patents. First, by requiring inventors to show that there is an actual group of people out there that is willing to purchase the invention, we can ensure that inventors improve their inventions at least up to the point where they become truly useful and beneficial. Patents would not be secured over pre-matured inventions the public does not desire. In turn, patents will no longer function as experimentation closures. Further research and development of the invention would be encouraged up and until it’s commercial utility is revealed.

Similarly, by requiring patent applicants to show that their invention can be manufactured at a cost sufficient to fulfill market demand, we could cure the problem associated with patents that are commercially essential but nonetheless extremely unaffordable. While such patents impose heavy monopoly costs on our society, they do not benefit the public. Instead, they impede subsequent experimentation of the underlining invention that might lead to the discovery of cheaper methods of production or exploitation that will make the invention more attainable.

Second, requiring proof of prospective demand to the claimed invention will also prevent the issuance of trivial and absurd patents. Although such low value patents do not decrease public welfare significantly, they still fail to benefit the public. With such trivial patents, the social costs imposed by the grant of monopoly rights outweigh the social benefit of meaningful innovation, and hence, patent protection should not be afforded. Conceivably, if patent applicants were required to show proof of prospective demand to the claimed invention, most absurd patent applications would be rejected as ineligible. Obviously, an applicant claiming a dining table that is also a dishwasher would find it practically impossible to convince a person having ordinary skill in the art that there is a group of people out there that will actually pay for such a bizarre and useless improvement.

261 See the example supra on pg. 45-6.
Third, inquiring whether the claimed invention can be delivered to or practiced by a sufficient market at a market-clearing price could potentially eliminate the barriers patents over small components impose on “component-driven industries,” notably IT. If inventors of components were required to show that “the cost of the component will not drive up the price of the end-product so much as to make it non-competitive,” they would be bound from later demanding un-proportional licensing fees for the permission to exploit the component. Notice, that the dual requirement for commercial utility is not limited to end products. Rather, it is totally applicable to non-consumer products, components of other products, and even processes. For each type of invention, the applicant is simply required to prove that a sufficient portion of the public will be willing to purchase the good/service at a market-clearing price.

Besides addressing these evocative problems, requiring proof of prospective commercialization has some additional advantages. First, patent disclosure would improve because patentees would know more about the invention and would face more difficulty suppressing valuable information from patent applications. Second, requiring proof of prospective commercialization will increase the clarity of patent claims. Indeed, “it will be more difficult to show manufacturability and consumer demand for abstract claims.” Third, requiring patentees to show prospective commercialization should prevent them from claiming a broader claim scope than they have invented. Patentees claiming broad, generalized claims would be required to show prospective commercialization of all the potential products that might fall under a broad scope. Consequently, inventors would have to devote more effort actually inventing the broader claim scope.

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263 Id.
264 Id.
265 Id. at 1249.
266 Id.
267 Id. at 1250.
Finally, adding an additional requirement of proof of prospective commercialization will potentially decrease overall litigation. There is no doubt that with this additional requirement more inventions will inevitably fall into the gray area of suspected eligibility. Consequently, unwarranted inventions having no prospective commercial use could be excluded during the initial prosecution stage, sparing subsequent litigation over invalidity issues.

C. POSSIBLE DOWNSIDES OF ADOPTING THE PROPOSED REQUIREMENTS

Adopting this article’s proposed additional requirements for subject matter eligibility, namely proof that the claimed invention would not have been developed but for the incentives afforded by the Patent Act and proof of prospective commercialization, raises some inevitable concerns. As a practical matter, implementing the proposed novel requirements would not be an easy task, mainly because they do not articulate bright line rules of eligibility. These requirements do not state what amount of monetary investment would be considered high enough to justify a grant of a patent, nor do they stipulate how many people who are allegedly willing to purchase the claimed invention would constitute a sufficient consumer demand. Hence, like with other common law standards, an effective application of the proposed requirements will require patent examiners and judges to reach a final determination on a case-by-case basis and this may increase administrative costs. The PTO might be required to hire more patent examiners to handle the backlog of patent applications, as each examination will presumably last longer if the proposed requirements are adopted. It will definitely be required to hire several businessmen in order to evaluate the second requirement.

Nevertheless, since the proposed requirements enunciate a flexible approach, they can provide the decision maker with “the flexibility to accommodate the


269 Risch, Reinventing usefulness, supra note 206, at 1250.
new and unpredictable wonders of human ingenuity.” 270 While they clearly specify the sort of evidence the applicant is required to present to overcome her burden of proof, they do not promote a rigid rule of exclusion, allowing for a discretionary and flexible determination of patent eligibility. Also, the prospected decease in the number of patent applications that would be filed, if the proposed requirements are adopted, should mitigate the increase in administrative costs.

An additional downside of the proposed requirements relates to their implications over the dissemination of knowledge. Since patentees would be required to show both sufficient monetary investment in the invention, and sufficient commercialization efforts, it is expected that they will postpone their application’s filing date. As a result, it will take longer for inventions to become publicly known. 271 This may lead to two negative consequences: First, competitors might invest fruitless efforts in developing an invention that has been already conceived. With no researchable patent application, competitors would be deprived from knowing what has been already invented. This uncertainty will allegedly increase the costs of inventing. 272

Nonetheless, it can be argued that such double patenting efforts already exist since patent applications currently remain secret for at least eighteen months. 273 Additionally, often times the inventor is the only one developing the invention, so no double efforts actually take place. 274 And finally, double efforts may lead to different beneficial applications, which is good for competition and innovation. 275

Second, inventors who depend on the development of correlated technologies in order to complete their own inventions would not be able to progress so long

270 Daffy, supra note 16, at 611.
274 Risch, Reinventing Usefulness, supra note 206, at 1254.
275 Id.; See also Cotropia, supra note 210, at 86 (“Two companies may be attempting to solve a given problem and, at the end of the race, produce two viable solutions.”).
the necessary technology is not published.°276 Delaying the publication of patent applications would hence deprive others of the ability to learn from the disclosure and develop related technologies.°277 Moreover, some potential patentees might even elect to abandon their applications fearing they would not be able to overcome their burden of proof. As a result, some important information, even if not commercially beneficial, or not depended on the Patent Act’s incentives in its formation, would be completely eliminated from the public domain.°278

Nonetheless, since inventions would be developed up to the point where they acquire commercial utility, they would become more affordable. Correlated or dependent technologies will be able to obtain the patented technology for purposes of cumulative innovation without facing unreasonable demand prices.

Another downside of the proposed requirements concerns the possible delay in the issuance of new patents.°279 Because patent applications would be examined under two additional requirements, it might take them longer to reach a final determination. Yet, this may be mitigated by the prospected decrease in the number of patent applications that would be ultimately filed, if the proposed eligibility requirements would be eventually adopted.°280 In any event, according to the PTO’s Data Visualization Center, it currently takes almost three years to get a patent.°281 Accordingly, an additional delay for the sake of improving patent quality and decreasing overall litigation should be tolerable.

Another concern raised by the proposed requirements for subject matter eligibility relates to their effect over the patenting potential of independent inventors. More specifically, it might be argued that the proposed requirements favor commercial entities over private entities because the former are more likely to possess the necessary commercialization capacity as well as the ability to

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276 Risch, Reinventing Usefulness, supra not 206, at 1253.
277 Id.
278 Id.
279 Id. at 1251.
280 Id., at 1251.
invest more time and money in inventing.\textsuperscript{282} However, if small and independent inventors provide little additional inventive benefits and instead large companies simultaneously develop most inventions, as actually evidenced, \textsuperscript{283} then inhibiting independent invention may be bearable. In any event, assuming the goal of the system is bringing new inventions to the market then it is arguably socially beneficial to put patents into the hands of companies most likely to innovate.\textsuperscript{284}

Finally, it may be contended that adopting the proposed requirements would entail litigants to spend more on research and analysis in order to build a winning subject matter ineligibility ground of invalidation. In particular, it could be argued, that adding the requirement of proof that the invention would not have been developed but for the incentives afforded by patent laws would necessitate litigants to engage into research and analysis of the costs of developing the invention, the invention’s use (whether it is consumed by the inventor) and the availability of other legal protections. Similarly, it may be argued that requiring proof of prospective commercialization would inevitably require defendants to spend more money on research and analysis to prove that there is actually no market for the invention, or that the invention cannot be marked at a reasonable price.

Nevertheless, this information is likely to be found in the patent application or otherwise in the patentee’s possession. In any event, any additional research expenditures litigants would incur should be modest in comparison to the enormous expenditures involved in building a winning anticipatory or obviousness objection. Indeed, this article provides clear and specific factors to determine whether a claimed invention should be found patent eligible under the proposed requirements. Proving these technical factors should be nothing like diving into the endless ocean of prior art in search for that one piece capable of invalidating the claimed invention. In any event, it is reasonable to assume that in time, the PTO and the various courts will come up with practical

\textsuperscript{282} Reinventing Usefulness, supra note 206, at 1251.

\textsuperscript{283} James Bessen & Michael J. Meurer, Patent Failure: How Judges, Bureaucrats, and Lawyers put Innovators at Risk 168 (2008) (explaining that benefits of small inventors depends on the type of inventor, but in general small inventors are not inventing highest value inventions).

\textsuperscript{284} Reinventing Usefulness, supra note 206, at 1252.
guidelines that will assist patent applicants and potential defendants to prepare
the necessary evidence more efficiently and with less expenses.

CONCLUSION

There is a rising concern about the issuance of poor quality patents by the
U.S. Patent and Trademark Office. While critics most frequently cite patents of
dubious quality, including a method of swinging on a swing and a method of
exercising a cat, the real bad patents are a small number of poor quality but
economically important patents. “It is these that are particularly vulnerable to
abuse by patent trolls and contribute to the widespread sense that the U.S. patent
system is undergoing a breakdown.” This article identified two types of
unwarranted patents: patents whose development is not depended on the
incentives afforded by the Patent Act and patents who lack any intended
commercial use. It then showed that neither the current doctrine of subject
matter eligibility nor the other statutory requirements for patentability, namely
novelty, non-obviousness and adequate disclosure, effectively exclude them.

Proving that subject matter eligibility is the most efficient statutory
mechanism capable of excluding such unwarranted patents for practical,
economic and normative reasons, this article took the challenge of reviving
section 101’s gatekeeping function. Accordingly, it adopted a flexible
gatekeeping approach instead of the traditional, “one fits all” gatekeeping
approach, and proposed to exclude subject matters for policy reasons,
irrespective of their categorical pertinence. Particularly, this article suggested
supplementing the three common law exceptions that underline the current
doctrine of subject matter eligibility with two additional policy-based
requirements. The first demands a showing sufficient to convince a person
having ordinary skill in the art, that the invention would not have been
developed “but for” the incentives afforded by the Patent Act. The second

287 Walmsley Graf, supra note 150, at 496.
demands a showing sufficient to convince a businessman that, a) there is a market for the invention, and that b) the invention can be manufactured at a cost sufficient to fulfill market demand.

The proposed solution is not perfect. It may cause delay in the dissemination of knowledge and disadvantage independent inventors. Nonetheless, between the different allegedly bright line rules of exclusion that seek to exclude many of the kinds of inventions that apply to today’s electronic technologies, and a vague, “I know it when I see it”, criteria articulated by the three common law exceptions to subject matter eligibility, the proposed solution is the most appropriate. Accordingly, the adoption of this article’s proposed requirements is highly recommended.

288 Justice Potter Stewart used this phrase to describe the threshold of obscenity in Jacobellis v. Ohio, 378 U.S. 184 (1964).