

ARTICLES

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 “[t]o 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.

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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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I. 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 therefor *[sic]*, subject to the conditions 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.³

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”⁴ for being “part of the storehouse of knowledge of all men . . . free to all men and reserved exclusively to none.”⁵ So long as 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.⁶

¹ 35 U.S.C.A. § 101 (West, Westlaw through P.L. 112-207 approved 12/07/12).

² Peter Yun-Hyoung Lee, *Inverting the Logic of Scientific Discovery: Applying Common Law Patentable Subject Matter Doctrine to Constrain Patents on Biotechnology Research Tools*, 19 HARV. J.L. & TECH. 79, 93 (2005).

³ David S. Olson, *Taking the Utilitarian Basis for Patent Law Seriously: The Case for Restricting Patentable Subject Matter*, 82 TEMP. L. REV. 181, 184–85, 186 (2009) (noting that courts in the U.S. actively interpreted patent laws to limited the scope of patentability of inventions).

⁴ *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980).

⁵ *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948).

⁶ *See, e.g.*, *O’Reilly v. Morse*, 56 U.S. 62, 132–33 (1853) (stating that a mechanical device that improves upon “discovery of a new element, or law, or

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Accordingly, different commentators began advocating the categorical exclusion of software and business method inventions.⁷ 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.⁸ 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.⁹

principle of nature” can be patented, but “[t]he mere discovery . . . without any valuable application of it to the arts, is not the subject of a patent”); *Chakrabarty*, 447 U.S. at 2205, 2208. (discussing that Congress’ use of “manufacture” or “composition of matter” in 35 U.S.C. § 101 is not evidence of their intent to preclude living things as patentable, and therefore held “a live, human-made, micro-organism is patentable subject matter under [section] 101.”).

⁷ See Jay Dratler, Jr., *Does Lord Darcy Yet Live? The Case Against Software and Business Method Patents*, 43 SANTA CLARA L. REV. 823, 879–99 (2003); Dan L. Burk & Mark A. Lemley, *Policy Levers in Patent Law*, 89 VA. L. REV. 1575, 1577–89, 1687–93 (2003) (arguing for a non-monolithic approach to patents for varying industries and recommending a new policy lever for software industries); Rochelle Cooper Dreyfuss, Essay, *Are Business Method Patents Bad for Business?* 16 SANTA CLARA COMPUTER & HIGH TECH. L.J. 263 (2000) (advocating for the exclusion of business method patents); Robert P. Merges, *As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform*, 14 BERKELEY TECH. L.J. 577, 588–615 (1999) (proposing an approach for business concept patents); Olson, *supra* note 3, at 227–36 (discussing the effect of patents on business methods); Leo J. Raskind, *The State Street Bank Decision: The Bad Business of Unlimited Patent Protection for Methods of Doing Business*, 10 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 61 (1999) (discussing the implications of the *State Street Bank* decision on business method patentability); Bronwyn H. Hall, *Business Method Patents, Innovation and Policy* 1 (Univ. of Cal., Berkeley Competition Policy Ctr., Working Paper No. CPC03-39, 2003), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=463160.

⁸ Mark A. Lemley et al., *Life After Bilski*, 63 STAN. L. REV. 1315, 1326 (2011); see, e.g., Olson, *supra* note 3, at 227 (“[If] the Court reclaim[s] its role of crafter of section 101 common law[,] the Court should proclaim that both Congressional intent and the fact that the Constitution grants Congress the patent power solely . . . [would eliminate] those subjects that do not need the incentive of the patent grant . . . for patents under section 101.”).

⁹ See *Gottschalk v. Benson*, 409 U.S. 63, 67–68, 71–72 (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, 585–86, 591–92 (1978) (rejecting the invention at issue for having no novel aspects that were independent from the algorithm); *Diamond v. Diehr*, 450 U.S. 175, 187, 191–93 (1981) (upholding patentability of 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

When applying the common law exceptions, courts initially relied on the traditional tests they have developed to identify unpatentable subject matter.¹⁰ 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.¹¹ Therefore, the courts elected to abandon these patentable subject matter tests, adopting instead a broad reading of § 101, and virtually accepting that “anything under the sun that is made by man” is patentable.¹²

Hence, gradually diminishing § 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.’”¹³ Those requirements include that “the invention be novel . . . nonobvious . . . and fully and particularly described.”¹⁴ 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.”¹⁵

Predictably, with no adequate tools to exclude patents claiming impermissible subject matter, “unwarranted patents”—patents that fail the constitutional mandate “[t]o promote the Progress of Science and useful Arts . . .”¹⁶—began invading the realm of patentability. Today, patents are granted irrespective of whether they are actually needed to incentivize innovation.¹⁷ Consequently, they fail to reflect an appropriate “balance

structure or process may well be deserving of patent protection.”); Lemley et al., *supra* note 8, at 1326–27.

¹⁰ Olson, *supra* note 3, at 204–05.

¹¹ *See id.* at 205–18 (discussing the history of these tests to determine patentable subject matter).

¹² *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980); Olson, *supra* note 3, at 187.

¹³ *Bilski v. Kappos*, 130 S. Ct. 3218, 3225 (2010).

¹⁴ *Id.*

¹⁵ Olson, *supra* note 3, at 187.

¹⁶ U.S. CONST. art. I, § 8, cl. 8.

¹⁷ *See* Olson, *supra* note 3, at 181 (“[C]ourts have expanded patentable subject matter to many new fields without first demanding evidence that the newly patentable fields suffer from lack of incentives to innovate.”).

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between the *ex post* costs of short-term monopoly and the benefits of higher *ex ante* incentives to innovate.”¹⁸ With such patents, the decreased competition and increased costs associated with patent monopoly exceed the benefit society gains from increased innovation.¹⁹ 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.²⁰ 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.²¹

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 § 101.²² Acknowledging that a strict “one fits all” approach for determining subject matter eligibility, while incontestably certain and predictable,²³ cannot leave room “for the revelations of the new, onrushing technology,”²⁴ 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 of over-exclusiveness or under-exclusiveness associated with

¹⁸ *Patent-Eligible Subject Matter*, 124 HARV. L. REV. 370, 376 (2010) (emphasis added).

¹⁹ See Olson, *supra* note 3, at 193 (“The system . . . is designed to keep the price paid by society in the form of the patent monopoly, with its resultant decreased competition and increased costs, less than the benefit that society gains from the increased invention of new, useful, nonobvious things.”).

²⁰ *Id.* at 189 (discussing the issuance of “worthless patents” and how despite the fact that the patent owners do not make use of the patent they continue to “extract payments from firms that do or make things that arguably are covered by these . . . patents”). These are secured by entities known as “patent trolls.” See *infra* notes 334–35 and accompanying text.

²¹ See *infra* Part III.

²² See *infra* Part IV.

²³ John F. Duffy, *Rules and Standards on the Forefront of Patentability*, 51 WM. & MARY L. REV. 609, 611 (2009).

²⁴ *Gottschalk v. Benson*, 409 U.S. 63, 71 (1972).

per se rules of categorical exclusions.²⁵

Part II of this article will discuss the various ways subject matter eligibility has been approached throughout the history of our patent system.²⁶ 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 approach²⁷ and the radical “everything is patentable”²⁸ approach, this part will attempt to situate the proposed approach in the middle of the spectrum, slightly closer to the stricter side.²⁹

In Part III, this article will attempt to explain why it is advisable to strengthen § 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 patents³⁰ 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

²⁵ Lemley et al., *supra* note 8, at 1326–27.

²⁶ *See infra* Part II.

²⁷ *See infra* Part II.

²⁸ Michael Risch, *Everything Is Patentable*, 72 TENN. L. REV. 591, 591 (2008) (discussing the unnecessary rigorousness of the subject matter requirements of patentability and proposing a rule that satisfaction of “utility, novelty, nonobviousness, and specification” should mean that an invention is “properly patentable”); *see infra* Part II.B.2.

²⁹ *See* diagram *infra* p. 348.

³⁰ *See infra* Part III. 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* Lemley et al., *supra* note 8, at 1345; Dennis Crouch & Robert P. Merges, *Operating Efficiently Post-Bilski by Patentability and Proposing a Rule that Satisfaction of “Utility, Novelty, Nonobviousness, and Specification” Should Mean that an Invention is “Properly Patentable”*; *see infra* Part II.B.2.

³⁰ *See* diagram *infra* p. 348.

Ordering Patent Doctrine Decision-Making, 25 BERKELEY TECH. L.J. 1673, 1674 (2010); Duffy, *supra* note 23, 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 (2007) (“[T]he Patent Office may be using [section] 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. *See infra* Part III.C.

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necessary to execute a novelty or non-obviousness rejection.³¹

From an economic perspective, this part will demonstrate why retaining subject matter eligibility is economically efficient.³² 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.³³

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.³⁴ Such patents are economically valuable and therefore particularly vulnerable to abuse by patent trolls.³⁵ 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.³⁶ After presenting

³¹ The essence of most patent examination procedures focuses on two inquiries: novelty and non-obviousness. “Novelty asks whether the invention is new”, while “[n]on-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. See Beth Simone Noveck, *“Peer to Patent”: Collective Intelligence, Open Review, and Patent Reform*, 20 HARV. J. L. & TECH. 123, 134–37 (2006).

³² See *infra* Part III.B.

³³ See Susan Walmsley Graf, *Improving Patent Quality Through Identification of Relevant Prior Art: Approaches to Increase Information Flow to the Patent Office*, 11 LEWIS & CLARK L. REV. 495, 501–02 (2007) (suggesting that if examiners made more adamant attempts to discover prior art when assessing patent applications, the volume of litigation would likely decrease); see Mark A. Lemley, *Rational Ignorance At The Patent Office*, 95 NW. U. L. REV. 1495, 1497 (2001) (proposing the notion that it is not always reasonable, based on the U.S. Patent & Trademark Office’s available resources, to perform genuinely extensive patent searches during the patent examination process).

³⁴ Graf, *supra* note 33, at 500.

³⁵ *Id.* at 496.

³⁶ David Olson argues that “the most efficient patent regime is one that starts by determining initially, on a *category-by-category* basis, whether *classes*

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.³⁷

Finally, Part IV will propose two new aspects of eligibility and will suggest incorporating them under the current doctrine of subject matter eligibility.³⁸ 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.³⁹ 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.⁴⁰ 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.⁴¹

II. THE DIFFERENT APPROACHES TO SUBJECT MATTER ELIGIBILITY

Subject matter eligibility has been approached in different ways throughout the history of our patent system.⁴² Traditional subject matter approaches think about it as a gatekeeper designated to keep the gates of patentability closed to specific

of inventions should be patentable”. Olson, *supra* note 3, at 202 (emphasis added). 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’s proposal articulates a traditional gatekeeping approach to subject matter eligibility as it suggests a categorical exclusion of entire fields of inventions. *Id.* at 201–03. 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. *See infra* Part III.C.1.

³⁷ Olson, *supra* note 3, at 192–93.

³⁸ *See infra* Part IV.

³⁹ *See infra* Part IV.A.

⁴⁰ *See infra* Part IV.B.

⁴¹ *See infra* Part IV.

⁴² *See* Diamond v. Diehr, 450 U.S. 175, 194–97 (1981) (discussing the general background of the past approaches to the patent system).

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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.⁴³ 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,⁴⁴ tax strategies,⁴⁵ and other types of invention from the scope of patentable subject matter.⁴⁶

These strict approaches, however, do not dominate the majority's view in the judiciary system.⁴⁷ In fact, it seems like the traditional gatekeeping approaches to subject matter eligibility slowly fade away.⁴⁸ 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.⁴⁹ These approaches encourage case-by-case validity

⁴³ *See id.* at 185 (“This Court has undoubtedly recognized limits to [section] 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.”).

⁴⁴ Burk & Lemley, *supra* note 7, at 1618; Dratler, Jr., *supra* note 7, at 823; Dreyfuss, *supra* note 7, at 263–65; Merges, *supra* note 7, at 577; Olson, *supra* note 3, at 227–36; Raskind, *supra* note 7, at 92; Hall, *supra* note 7, at 15–17.

⁴⁵ William A. Drennan, *The Patented Loophole: How Should Congress Respond to this Judicial Invention?*, 59 FLA. L. REV. 229, 235–36 (2007).

⁴⁶ These include the exclusion of plants and animals (Duffy, *supra* note 23, at 625–32), the exclusion of medical and surgical techniques (Morton v. N.Y. Eye Infirmary, 17 F.Cas. 879, 882–83 (C.C.S.D.N.Y. 1862) (holding that use of ether for anesthesia cannot be patented); *Ex parte* Brinkerhoff, 1883 Dec. Comm’r Pat. 349, *reprinted in* 27 J. PAT. & TRADEMARK OFF. SOC’Y 797, 798 (1945) (stating that methods of treatment of diseases are not patentable)), and the exclusion of printed matter (*In re* Sterling, 70 F.2d 910, 912 (C.C.P.A. 1934) (discussing bank check and stub systems); *In re* Reeves, 62 F.2d 199, 199–200 (C.C.P.A. 1932) (referencing a chart to aid in building appraisals); *In re* Russell, 48 F.2d 668, 668–69 (C.C.P.A. 1931) (showing that a system for indexing names in a directory is unpatentable)).

⁴⁷ *Bilski v. Kappos*, 130 S. Ct. 3218, 3228 (2010) (rejecting a categorical exclusion of business methods).

⁴⁸ Olson, *supra* note 3, at 181.

⁴⁹ Joshua D. Sarnoff, *Patent-Eligible Inventions After Bilski: History and Theory*, 63 HASTINGS L.J. 53, 56 (2011); *see also* Research Corp. Techs. v. Microsoft, 627 F.3d 859, 868 (Fed. Cir. 2010) (pointing to Judge Rader’s opinion, which emphasized that patentable subject matter is only a “threshold test” that need not exclude every invention that is unworthy of a patent). Some have 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

evaluations under the patentability standards of novelty⁵⁰, non-obviousness,⁵¹ and adequate disclosure, and minimize the role of subject matter eligibility.⁵²

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.⁵³ Acknowledging that the common law exceptions cannot, alone, exclude all unwarranted patents; this article suggests supplementing them with two additional policy-based requirements. Together, these two sets of flexible exceptions will optimize the gatekeeping potential of subject matter eligibility.⁵⁴

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.⁵⁵

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
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patentability—[sections] 102, 103, and 112, for instance—ought to be disposed of without considering subject matter patentability." Crouch & Merges, *supra* note 30, at 1674.

⁵⁰ 35 U.S.C.A. § 102 (West, Westlaw through P.L. 112-207 approved 12/07/12) (outlining all of the statutory requirements for having the right to patent an invention, particularly as it relates to novelty of the invention).

⁵¹ 35 U.S.C.A. § 103 (West, Westlaw through P.L. 112-207 approved 12/07/12).

⁵² 35 U.S.C.A. § 112 (West, Westlaw through P.L. 112-207 approved 12/07/12) (highlighting the disclosure requirements of a patent's specification).

⁵³ *See infra* Part II.A.1.

⁵⁴ *See infra* Part IV (providing a detailed explanation of the author's suggested approaches).

⁵⁵ *See* diagram *supra* p. 348 (illustrating the author's approaches on a spectrum).

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Traditional gatekeeping approaches characterize subject matter eligibility as the “first door” an invention must pass through in order to obtain patent protection. 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.⁵⁶ Advocating categorical rules of exclusions, traditional gatekeeping approaches are often presumed to have the potential of “reduc[ing] administrative costs of the patent system by restricting the number of patent applications that require more costly individualized examination.”⁵⁷ The following section will describe the most prominent gatekeeping approaches to subject matter eligibility and explain their underlining policies.

1. Excluding Laws Of Nature, Physical Phenomena And Abstract Ideas

The present Patent Act, enacted in 1952, defines in § 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 therefore [*sic*], subject to the conditions and requirements of this title.”⁵⁸ While the different patent laws have defined patentable subject matter affirmatively, they did not “explicitly enumerate that which is not patentable.”⁵⁹ As a result, different gatekeeping approaches throughout the years have limited the reach of this broad statutory definition.⁶⁰

The oldest among these approaches calls to exclude “laws of nature, physical phenomena, and abstract ideas.”⁶¹ Indeed, way back in 1853, when affirming a patent on a process for

⁵⁶ Rebecca S. Eizenberg, *Wisdom of the Ages or Dead-Hand Control? Patentable Subject Matter for Diagnostic Methods After In re Bilski*, 3 CASE W. RES. J.L. TECH. & INTERNET 1, 43–44 (2012).

⁵⁷ *Id.* at 44.

⁵⁸ 35 U.S.C.A. § 101 (West, Westlaw through P.L. 112-207 approved 12/07/12).

⁵⁹ Lee, *supra* note 2, at 93.

⁶⁰ *See id.* at 93–94 (describing the limitations of courts’ interpretations of the statute with regard to the reasoning behind the patentability of certain inventions).

⁶¹ *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980).

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.”⁶²

The Policies Underlining the Common Law Exceptions

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,⁶³ but in fact, the common law exceptions articulate a flexible gatekeeping approach: they exclude inventions for policy reasons regardless of their categorical pertinence.⁶⁴ 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,⁶⁵ the approach dominating our case law interprets the common law exceptions restrictively and opposes categorical exclusions of “whole fields of endeavor.”⁶⁶

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 § 101 is a “dynamic provision designed to encompass new and unforeseen inventions,”⁶⁷ 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.”⁶⁸

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

⁶² *Le Roy v. Tatham*, 55 U.S. 156, 174–75 (1852); *see also O’Reilly v. Morse*, 56 U.S. 62, 112–13 (1853) (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.”).

⁶³ *Duffy*, *supra* note 23, at 639–40.

⁶⁴ *Id.* at 638–39, 646.

⁶⁵ *Sarnoff*, *supra* note 49, at 56–57.

⁶⁶ *Duffy*, *supra* note 23, at 613; *see also Bilski v. Kappos*, 130 S. Ct. 3218, 3226 (2010) (“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.”).

⁶⁷ *J.E.M. Ag Supply v. Pioneer Hi-Bred Int’l*, 534 U.S. 124, 124, 135 (2001).

⁶⁸ *Diamond v. Chakrabarty*, 447 U.S. 303, 315 (1980).

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application.⁶⁹ As the Court stated in *Funk Brothers 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 none.”⁷⁰ 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*, “[p]henomena 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.”⁷¹

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.⁷² As acknowledged by the Court in *Parker v. Flook*, “[w]hether 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.”⁷³

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.⁷⁴ 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

⁶⁹ Lee, *supra* note 2, at 100.

⁷⁰ *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948).

⁷¹ *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972).

⁷² Lee, *supra* note 2, at 102; Sarnoff, *supra* note 49, at 57.

⁷³ *Parker v. Flook*, 437 U.S. 584, 591–92 (1978) (quoting *Benson*, 409 U.S. at 67).

⁷⁴ See, e.g., *Benson*, 409 U.S. at 67 (stating that natural phenomena, abstract ideas and mental processes are not patentable); cf. Lee, *supra* note 2, at 93–94 (stating that the Supreme Court itself at times used tautological reasoning in attempting to define “patentable principles” because the patent laws “do not explicitly enumerate that which not patentable,” and as a result of this ambiguity, it is difficult to apply the common law exceptions).

unwarranted patents can easily cross the gates of subject matter eligibility and enter the realm of patentability.⁷⁵

a. 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.⁷⁶ Under this test, a process was found to claim a patentable subject matter if it resulted in a physical transformation in the material world.⁷⁷ 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.⁷⁸ Nevertheless, with the advent of the programmed computers, the effectiveness of this test has begun to erode.⁷⁹ 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.⁸⁰

At first, computer programs were excluded from patent protection.⁸¹ Nonetheless, it was soon acknowledged that some

⁷⁵ See Lee, *supra* note 2, at 93 (“[T]he patent laws only define patentable subject matter affirmatively, they do not explicitly enumerate that which not patentable.”).

⁷⁶ Asher Hodes, *Diagnosis Patentable Subject Matter*, 26 BERKELEY TECH. L.J. 225, 228 n.27 (2011); see Lee, *supra* note 2, at 93–94 (stating that eighteenth, nineteenth, and early twentieth century patent acts’ “definition of patentable subject matter include[d] ‘any new and useful art, machine, manufacture or composition of matter, or any new and useful improvement on any art, machine, manufacture or composition of matter, not known or used before the application.’”).

⁷⁷ See, e.g., *Dolbear v. Am. Bell Tel. Co.*, 8 S. Ct. 778, 782 (1888) (using these “telephone cases” to 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 3, at 206 (explaining how the physical transformation test functioned).

⁷⁸ Olson, *supra* note 3, at 207.

⁷⁹ *Id.*

⁸⁰ *Id.*

⁸¹ As discussed in the Samuelson article, the 1966 Presidential Commission on the Patent System concluded that software should not be patentable. Pamela Samuelson, *Benson Revisited: The Case Against Patent Protection for Algorithms and Other Computer Program-Related Inventions*, 39 EMORY L.J. 1025, 1038–39 (1990). Subsequently, the PTO published new examination guidelines that were designed to disallow software patents and maintain the

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sorts of computer programs might be very well found eligible for patent protection.⁸² 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.”⁸³ Specifically, this test “den[ie]d patentability to inventions consisting mainly of mathematical formulas, methods of computation, or other mental operations.”⁸⁴ The mental steps doctrine’s longevity, however, was not remarkable and in 1968 the Court of Customs and Patent Appeals (“CCPA”) rejected the doctrine as a misinterpretation of prior precedents.⁸⁵

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.⁸⁶ 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.”⁸⁷ 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.⁸⁸ Observing that a procedure for solving a given type of mathematical problem is

physical transformation test. Under the proposed guidelines, a computer program by itself, whether claimed as an apparatus or a process, was unpatentable 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 3, at 209.

⁸² Olson, *supra* note 3, at 209.

⁸³ *Id.*

⁸⁴ *Id.*; see *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, 557 (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, 1060 (C.C.P.A. 1933) (denying patentability of a method of producing printed publications from manuscripts).

⁸⁵ *In re Prater*, 415 F.2d 1378, 1389 (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); see also Samuelson, *supra* note 81, at 1034, 1039–43 (providing a comprehensive discussion of the involvement of the mental steps doctrine to the algorithm exception).

⁸⁶ Olson, *supra* note 3, at 211.

⁸⁷ *Gottschalk v. Benson*, 409 U.S. 63, 71–72 (1972).

⁸⁸ *Parker v. Flook*, 437 U.S. 584, 585–86, 594 (1978).

unpatentable law of nature, the Court found the claimed invention to claim an ineligible subject matter.⁸⁹

Just like its predecessors, however, the algorithm exception was soon abandoned. Symbolizing its abandonment is the Court's 1980 *Diamond v. Chakrabarty* decision.⁹⁰ 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.⁹¹ 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,'" and that (2) Congress had meant patentable "subject matter to 'include anything under the sun that is made by man,'" the Court implicitly expressed disagreement with drawing strict lines in these circumstances.⁹²

Indeed, the following Supreme Court case to concern subject matter eligibility proves that the Court's approach towards subject matter eligibility began changing.⁹³ 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.⁹⁴ Despite the similarities between *Diehr* and the previous case of *Flook*, the Court reached an opposite conclusion:⁹⁵ *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.⁹⁶

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.* case.⁹⁷ Considering whether a computer software performing mathematical accounting steps was patentable subject matter, the court held

⁸⁹ *Id.* at 589, 590.

⁹⁰ *Diamond v. Chakrabarty*, 447 U.S. 303, 309, 310 (1980) (citing *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130, 131 (1948)); Olson, *supra* note 3, at 214–15.

⁹¹ Olson, *supra* note 3, at 214.

⁹² *Chakrabarty*, 447 U.S. at 308–09 (quoting *U.S. v. Dubilier Condenser Corp.*, 289 U.S. 178, 199 (1933)); S. REP. NO. 82-1979, at 2399 (1952).

⁹³ Olson, *supra* note 3, at 216 (presenting *Diehr* as "signaling the Supreme Court's abandonment of a subject matter gatekeeping role").

⁹⁴ *Diamond v. Diehr*, 450 U.S. 175, 177 (1981).

⁹⁵ Olson, *supra* note 3, at 216.

⁹⁶ *Diehr*, 450 U.S. at 181, 184, 192–93.

⁹⁷ *State St. Bank & Trust Co. v. Signature Fin. Grp., Inc.*, 149 F.3d 1368, 1374–75 (Fed. Cir. 1998).

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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.”⁹⁸

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.⁹⁹ In 2008, the Federal Circuit decided *In re Bilski*, which concerned a method of hedging risk.¹⁰⁰ 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 if: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing.”¹⁰¹ The Federal Circuit held this test to be the sole test to determine subject matter eligibility, abandoning all prior tests for patentable subject matter.¹⁰²

The Supreme Court granted certiorari and affirmed that Bilski’s claimed invention was an unpatentable abstract idea.¹⁰³ 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 § 101.¹⁰⁴ Nevertheless, the Court’s majority provided no further guidance on how the

⁹⁸ *Id.* at 1373.

⁹⁹ *See, e.g., In re Bilski*, 545 F.3d 943, 964–66 (Fed. Cir. 2008) (exemplifying a case that did not utilize broad application).

¹⁰⁰ *Id.* at 949.

¹⁰¹ *Id.* at 954 (citing *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972) (“Transformation and reduction of an article ‘to a different state or thing’ is the clue to the patentability of a process claim that does not include particular machines.”); *Diehr*, 450 U.S. at 192–93 (holding that use of mathematical formula in process “transforming or reducing an article to a different state or thing” constitutes patent-eligible subject matter); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978) (“An argument can be made . . . [that the Supreme] Court has only recognized a process as within the statutory definition when it either was tied to a particular apparatus or operated to change materials to a ‘different state or thing.’”); *Cochrane v. Deener*, 94 U.S. 780, 788 (1876) (“A process is . . . an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing.”)).

¹⁰² *Bilski*, 545 F.3d at 956.

¹⁰³ *Bilski v. Kappos*, 130 S. Ct. 3218, 3218, 3231 (2010).

¹⁰⁴ *Id.* at 3227.

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.¹⁰⁵

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 Laboratories, Inc.*, which was decided last March, the Court elaborated on the “law of nature” exception to patentable subject matter.¹⁰⁶ 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.¹⁰⁷ 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.”¹⁰⁸ 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.”¹⁰⁹ Applying this inquiry, 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.¹¹⁰

¹⁰⁵ Adam Liptak, *New Court Term May Give Hints to Views on Regulating Business*, N.Y. Times, Oct. 5, 2009, at A1, available at <http://www.nytimes.com/2009/10/05/us/politics/05scotus.html>. See Lemley et al., *supra* note 8, at 1317 (“A focus on overclaiming allows courts to focus on what really matters: [W]hether the scope of the patentee’s claims is commensurate with the invention’s practical, real-world contribution, rather than asserting coverage over general ideas unmoored to a specific application. This inquiry, we suggest, is the touchstone of the abstract ideas analysis, and the way out of the post [*Bilski v. Kappos*] confusion.”).

¹⁰⁶ *Mayo Collaborative Services v. Prometheus Labs., Inc.*, 132 S. Ct. 1289 (2012).

¹⁰⁷ *Id.* at 1292, 1294–95, 1305.

¹⁰⁸ *Id.* at 1297.

¹⁰⁹ *Id.*

¹¹⁰ *Id.*

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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*.¹¹¹ 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.¹¹²

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.¹¹³ 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.¹¹⁴ 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.”¹¹⁵ Moreover, because they

¹¹¹ *Bilski v. Kappos*, 130 S. Ct. 3218, 3225 (2010) (citing *Le Roy v. Tatham*, 55 U.S. 156, 174–175 (1853)).

¹¹² Duffy, *supra* note 23, at 611.

¹¹³ *Cf.* Sarnoff, *supra* note 49, at 55–56 (noting that those who oppose engaging in categorical eligibility decisions based on the tradition exclusion categories of “science, nature, and ideas” believe in a more flexible method of line-drawing based upon case-by-case analysis). To be clear, these exclusions have never developed into binding law. *See supra* notes 106–10 and accompanying text (discussing a recent Supreme Court decision that upheld business methods patents as patent-eligible, demonstrating that the common law exceptions can be interpreted with flexibility).

¹¹⁴ *See* Lemley et al., *supra* note 8, at 1326–27 (stating that “gatekeeping theories are necessarily bright-line rules,” that do not account for “policy-based factors” in determining patentable subject matter).

¹¹⁵ *Id.* at 1326–27; *see also* Tun-Jen Chiang, *The Rules and Standards of Patentable Subject Matter*, 2010 WIS. L. REV. 1353, 1360, 1383–85 (2010) (“The problem with the excessive monopoly-cost theory when applied to patentable-subject-matter restrictions is one of over-inclusiveness,” and also discussing that the Court’s concern with over-inclusiveness has led to the elimination of certain categorical exclusions, such as the business methods.); Duffy, *supra* note 23, at 623 (“[I]t should be a rare situation in which an entire class of patents complies with the nonobviousness requirement and yet still somehow discourages or impedes the development and spread of useful knowledge,” because the purpose of the requirement is to encourage patents that will promote the “arts.”).

promote a rigid, black-or-white determination of subject matter eligibility, they are incapable of adjusting to the constant developments in technology.¹¹⁶ While these strict categorical exclusions purport to strengthen the role of § 101 as a gatekeeper, they fail to leave room for flexibility, which is crucial to any subject matter doctrine.¹¹⁷

a. The Exclusion of Software¹¹⁸

When software-related inventions began to appear in the 1950s and 1960s, they were “[considered] to be unpatentable subject matter.”¹¹⁹ 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.¹²⁰ 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.”¹²¹ 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 [and paper].”¹²² Second, software was considered to be a type of invention, the development of which is not dependent 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.¹²³ Third, since “both copyright

¹¹⁶ See Lemley et al., *supra* note 8, at 1326–27 (arguing that because gatekeeping approaches are “bright-line rules” without “very clear lines” as to what constitutes a certain subject matter, these approaches are susceptible to becoming over or under exclusive and could potentially eliminate important new inventions, such as in the case of communications technologies).

¹¹⁷ See *id.* (“The flexibility of any subject matter requirement is paramount given the rapidly changing nature of technology.”).

¹¹⁸ 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.” 17 U.S.C.A. § 101 (West, Westlaw through P.L. 112-207 approved 12/07/12).

¹¹⁹ Maayan Filmar, *A Critique of In re Bilski*, 20 DEPAUL J. ART. TECH. & INTELL. PROP. L. 11, 28 (2009).

¹²⁰ Samuelson, *supra* note 81, at 1038–39.

¹²¹ *Id.* at 1040.

¹²² *Id.* at 1041–44.

¹²³ *Id.* at 1040–41 (discussing incentives behind copyright and trade secret protection for software).

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and trade secret protection [were] available to protect [computer] programs, it appeared that patent protection was not needed” in this field of invention.¹²⁴

Today, much of the hostility against software patents focuses on the perception that such patents have “low quality,”¹²⁵ and not on the principle that software should be categorically excluded as ineligible subject matter.¹²⁶ It is often argued that affording software developers twenty years of government-sponsored monopoly discourages incremental innovation.¹²⁷ 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.¹²⁸ Another important

¹²⁴ *Id.* at 1041.

¹²⁵ See, e.g., Andrew M. Riddles & Brenda Pomerance, *Software Patentee Must Conduct Own Search: Prior-Art Searches Made by the Patent Office Are Not Thorough Enough to Be Trusted*, 20 NAT'L L.J. 20, col. 1 (1998) (discussing the need for software patent seekers to conduct their own prior art searches when filing for a patent, because Patent Office conducted searches produce relatively unreliable results, due to the lack of patents within the industry, and can therefore result in “software patents of questionable validity”); Glynn S. Lunney, Jr., *E-Obviousness*, 7 MICH. TELECOMM. & TECH. L. REV. 363, 366, 373–75 (2001) (discussing the impact of obviousness on patent validity); see also Charles Arthur, *The Patenting of Software is a Complete Mess and Discourages Innovation*, THE INDEPENDENT (LONDON, UK) (Jan. 7, 2004) (discussing issues with software patents), available at <http://cdsweb.cern.ch/record/718272/files/presscut-2004-009.txt>.

¹²⁶ Bronwyn H. Hall & Megan MacGarvie, *The Private Value of Software Patents*, 9 (Nat'l Bureau of Econ. Research, Working Paper No. 12195), available at http://www.nber.org/papers/w12195.pdf?new_window=1. The phrase “low quality patents,” has different interpretations in the literature. See *id.* (“[Q]uality of a patent is a somewhat ill-defined catchall term for all the characterizes that the particular analysis would like patents to have.”). 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 now, it is sufficient to say that “low quality” patents are patents that do not deserve the protection of our patent system. See *infra* Part III.C.2.

¹²⁷ See, e.g., Carl Shapiro, *Navigating the Packet Thicket: Cross Licenses, Patent Pools, and Standard Setting*, in 1 INNOVATION POLICY AND THE ECONOMY 119, 122–23 (Adam B. Jaffe et al. eds., 2001) (pointing out the negative consequences to consumers and producers of allowing multiple companies to hold patent monopolies on processes and business methods); Suzanne Scotchmer, *Standing on the Shoulders of Giants: Cumulative Research and the Patent Law*, 5 J. OF ECON. PERSPECTIVE 29, 32–35 (1991) (discussing the economic consequence of patent protection and licensing amongst first and second innovators).

¹²⁸ See Transcript of Jerry Baker Testimony, Sr. V.P. of Oracle Corp. at 34–35, Public Hearing on the Use of the Patent System to Protect Software-Related Inventions, USPTO (San Jose, Cal., Jan. 26, 1994) available at

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 underlining claims are often drafted too vaguely and too broadly.¹²⁹ As a result, with respect to software, the costs associated with granting monopoly rights outweigh the social benefit from public disclosure of valuable knowledge.¹³⁰

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 laws rather than by the general rule of free competition.¹³¹ His first factor asks whether "the project entail[s] significant technological risk, or just market risk, i.e., the risk of consumer non-acceptance,"¹³² 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."¹³³ Only if both questions are answered affirmatively the project should be found eligible for patent protection.¹³⁴

<http://www.uspto.gov/web/offices/com/hearings/software/sanjose/sjhrng.dos> (allowing patent holders to monopolize their inventions in software "does not fit well with the . . . industry," because "[s]oftware . . . consists of adept combinations of several ideas," which are improved upon and incorporated into newer versions rapidly); Julie Samuels, *Oracle v. Google Shows the Folly of U.S. Software Patent Law*, WIRED ENTERPRISE (Apr. 23, 2012, 4:05 PM), <http://www.wired.com/wiredenterprise/2012/04/opinion-samuels-google-oracle> ("Software is fundamentally situated as a building-block technology."); see also Paul Krill, *Chasing Bugs Away: Bugs Beware! Best Practices, Software Tools, and Code-Inspection Services Are on the Prowl*, INFOWORLD (Oct. 24, 2003), www.infoworld.com/article/03/10/24/42FEbugs_1.html (discussing issues within the software industry, which can be attributed to the fact that "software is probably the most complex [thing] we try to build today").

¹²⁹ Hall & MacGarvie, *supra* note 126, at 11.

¹³⁰ See Olson, *supra* note 3, at 193–94 (explaining the "deadweight loss" society that bears due to the granting of patent monopolies).

¹³¹ Dratler, Jr., *supra* note 7 at 853–54. Professor Dratler explains that "technological risks" (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." *Id.* at 845–46.

¹³² Dratler, Jr., *supra* note 7, at 853–54.

¹³³ *Id.* at 854.

¹³⁴ See *id.* at 848 ("[A] patent-eligible inventive project is one that involves technological risk," where "[a]t the outset of the project, there is a significant risk that the project will achieve no useful result . . . and that, regardless of

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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.”¹³⁵ 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.¹³⁶ Accordingly, he concludes that a “computer program[] that implement[s] business, commercial, or engineering methods should not be patentable unless those methods themselves involve substantial technological risk of failure and total loss.”¹³⁷

Another respectful academic who has recently contended that inventions in the field of computer programming should not be patentable is Professor Peter Junger. Finding support in recent case law, Professor Junger argued that under *Benson*, software is unpatentable subject matter and since the Court has never overruled *Benson*, it is still the governing law.¹³⁸ According to Professor Junger, the categorical exclusion of software is appropriate because:

[C]omputer 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.”¹³⁹

market acceptance, the work and sunk investment will be a total loss.”).

¹³⁵ *Id.* at 854–55.

¹³⁶ *See id.* at 857–60 (discussing that when a computer programs fails to meet its objectives because of memory issues, or issues related to the computer’s speed, that is not a failure of the program, but rather a hardware failure, since programmers simply follow “straightforward . . . convention ‘work’ rules of modular program design,” which will almost always be successful unless there is an outside issue). 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.” *Id.* at 860. 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 860–61.

¹³⁷ *Id.* at 870–71.

¹³⁸ Peter D. Junger, *You Can’t Patent Software: Patenting Software is Wrong*, 58 CASE W. RES. L. REV. 333, 334 (2008).

¹³⁹ *Id.* at 400–02.

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.¹⁴⁰ 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.¹⁴¹ 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.¹⁴²

b. The Exclusion of Business Methods

Unlike the case of software, the idea of categorically excluding business methods from patent protection is quite prevalent.¹⁴³ For centuries, a series of steps for conducting business was not considered, in itself, to be patentable subject 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.¹⁴⁴ In the late 1990's, the Federal Circuit changed this proposition and expanded the scope of subject matter eligibility to include business methods.¹⁴⁵ Specifically, *State Street* held that the business methods exception is *not* firmly grounded in any case law.¹⁴⁶ In response, Congress passed the First Inventors Defense Act of 1999, providing a limited defense to infringement claims for business methods.¹⁴⁷ In the following years, the Federal Circuit changed

¹⁴⁰ 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 and noting the availability of copyright protection as a substitute).

¹⁴¹ See *infra* Part III-A.

¹⁴² *Id.*

¹⁴³ See, e.g., Jared Earl Grusd, *Internet Business Methods: What Role Does and Should Patent Law Play?*, 4 VA. J.L. & TECH. 9, 10 (1999) (arguing for the unpatentability of business methods).

¹⁴⁴ See *id.* at 11–14 (explaining the difficulty of defining business methods at patentable material).

¹⁴⁵ See *State St. Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1373, 1373–74 (Fed. Cir. 1998), *abrogated by In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008) (holding a business method applicable as patentable material).

¹⁴⁶ Michael J. Meurer, *Business Method Patents and Patent Floods*, 8 WASH. U. J.L. & POL'Y 309, 311–13 (2002).

¹⁴⁷ Alli Pyrah, *From State Street to CLS: US Patent Eligibility Law in Review*, MANAGING INTELLECTUAL PROPERTY (Oct. 15, 2012), <http://www.managingip.com/Article/3103428/From-State-Street-to-CLS-US->

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course and narrowed the scope of patentable subject matter.¹⁴⁸ As to the Supreme Court, its last call on the patentability of business methods rejected a *per se* rule of exclusion, finding that “[t]he 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.”¹⁴⁹

Nevertheless, many academics and some judges continue to advocate the categorical exclusion of business methods.¹⁵⁰ From a practical perspective, these supporters contend that business methods do not comply with the constitutional mandate that patents are issued “[t]o promote the Progress of Science and useful Arts.”¹⁵¹ 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.”¹⁵² Specifically, it is argued that, “[c]ompanies have ample incentives to develop business methods even without patent protection, because the competitive marketplace rewards

patent-eligibility-law-in-review.html; First Inventor Defense Act of 1999, Pub. L. No. 106-113, § 4301, 113 Stat. 1536, 1501A-555 (1999) (codified at 35 U.S.C. § 273 (2000)) (enacting a limited prior user defense for business method patent infringement cases).

¹⁴⁸ See *In re Comiskey*, 499 F.3d 1365, 1376, 1378–79 (Fed. Cir. 2007) (rejecting a claimed process for a mandatory arbitration system for reciting nothing more than an abstract idea), *revised and superseded*, *In re Comiskey*, 554 F.3d 967 (Fed. Cir. 2009); *In re Nuijten*, 500 F.3d 1346, 1363, 1367–69 (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, 993–94, 1015 (Fed. Cir. 2008), *aff’d*, *Bilski v. Kappos*, 130 S. Ct. 3218 (2010) (Rader, J., dissenting) (stating that the court had invented “several circuitous and unnecessary tests” to determine if an abstract idea is patent-eligible subject matter).

¹⁴⁹ *Bilski v. Kappos*, 130 S. Ct. at 3228.

¹⁵⁰ See *id.* at 3233–34 (citing *In re Bilski*, 545 F.3d 943, 959–960 (2008)) (“Chief Judge Michel’s opinion, joined by eight other judges, rejected several possible tests for what is a patent-eligible process, including whether the patent produces a ‘useful, concrete and tangible result,’ whether the process relates to ‘technological arts,’ and ‘categorical exclusions’ for certain processes such as business methods.”).

¹⁵¹ U.S. CONST. art. I, § 8, cl. 8.

¹⁵² *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 people know when their actions are legal increases certainty that is essential to promote progress. See *Diamond v. Diehr*, 450 U.S. 175, 219 (1981) (Stevens, J., dissenting) (stating it is necessary to have “rules that enable a conscientious patent lawyer to determine with a fair degree of accuracy” what is patentable).

companies that use more efficient business methods.”¹⁵³

“A new business method increases profits by making a firm a more efficient producer, improving the quality of the firm’s product, decreasing costs of production, or simply by more effectively marketing the product.”¹⁵⁴ Moreover, it takes time for rivals to learn the new method and apply it to their own business model.¹⁵⁵ During this period of time, the company who invented the new business method can reap large gains from sales.¹⁵⁶ Thus, instead of applying for monopoly rights, the company can keep its new business method secret and enjoy the benefits of trade secret law.¹⁵⁷

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.¹⁵⁸ Finally, it is contended that business innovation “generally does not entail the same kinds of risk as does more traditional,

¹⁵³ *Bilski v. Kappos*, 130 S. Ct. at 3254 (quoting Burk & Lemley, *supra* note 7, at 1618). *See also* Michael A. Carrier, *Unraveling the Patent-Antitrust Paradox*, 150 U. PA. L. REV. 761, 826 (2002) (discussing that patents are not necessary for innovation in many industries and that patents play a relatively minor role in the creation of certain products); Dreyfuss, *supra* note 7, at 274–76 (stating that “while business innovations are certainly desirable, it is not clear that business method patents are needed to spur people to create them.”); Richard A. Posner, *The Law & Economics of Intellectual Property*, 131.2 DAEDALUS 5, 11 (2002) (explaining that the challenge of intellectual property rights is “striking the right balance between the interest in encouraging the production of intellectual property and the interest in promoting its widespread use”); Pamela Samuelson & Jason Schultz, Symposium, “Clues” for Determining Whether Business and Service Innovations are Unpatentable Abstract Ideas, 15 LEWIS & CLARK L. REV. 109, 121 (2011) (citing Stuart J.H. Graham et al., *High Technology Entrepreneurs and the Patent System: Results of the 2008 Berkeley Patent Survey*, 24 BERKELEY TECH. L.J. 1255, 1255, 1277 (2009)) (“In a recent survey of over 1,300 high technology entrepreneurs, close to three-fourths of software and e-commerce startups . . . reported that they do not own patents and have not applied for them, compared with less than a quarter of similarly-situated biotechnology and medical device companies.”).

¹⁵⁴ Olson, *supra* note 3, at 228.

¹⁵⁵ 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 7, 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 within the firms utilizing them—on compensation schemes, lines of reporting, supervising policies, and other business factors”).

¹⁵⁶ *Id.*

¹⁵⁷ *See* Olson, *supra* note 3, at 229 (explaining how a firm’s secret business method can serve as a kind of “monopoly protection”).

¹⁵⁸ *Id.* at 230.

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technological innovation.”¹⁵⁹ Turning back to Professor Dratler’s theory, it is argued that the only risk associated with the development of business methods is market risk, as distinguished from technological risk.¹⁶⁰ Not only is there 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.¹⁶¹

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 is gained from increased innovation.¹⁶² 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.¹⁶³

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.¹⁶⁴ This negative effect over innovation is allegedly “magnified by the ‘potential vagueness’ of business method patents.”¹⁶⁵ Usually consisting of

¹⁵⁹ *Bilski v. Kappos*, 130 S. Ct. 3218, 3254 (2010).

¹⁶⁰ Dratler, Jr., *supra* note 7, at 874.

¹⁶¹ See Samuelson & Schultz, *supra* note 153, at 124–25 (arguing that a good portion of business innovation is derived from customers and interactions at the place of business).

¹⁶² Olson, *supra* note 3, at 227–28 (suggesting that business methods should be excluded *per se*, except in those rare cases where they cannot be reliably separated into their own subject matter category).

¹⁶³ *Id.* at 234.

¹⁶⁴ James Bessen & Eric Maskin, *Sequential Innovation, Patents, and Imitation*, 40 RAND J. ECON. 611, 613 (2009). See also Dreyfuss, *supra* note 7, at 275–77 (arguing that business method patents result in less innovation, higher prices, and an inefficient marketplace); Leo J. Raskind, *The State Street Bank Decision: The Bad Business of Unlimited Patent Protection for Methods of Doing Business*, 10 FORDHAM INTELL. PROP. MEDIA & ENT. L. J. 61, 102 (1999) (“Interactive emulation more than innovation is the driving force of business method changes”).

¹⁶⁵ *Bilski v. Kappos*, 130 S. Ct. 3218, 3256 (2010) (citing *eBay Inc.*, 547 U.S. at 397 (Kennedy, J., concurring)).

intangible steps, it is contended that claims to business methods lack clarity which “is essential to promote progress.”¹⁶⁶ 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.”¹⁶⁷

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,¹⁶⁸ 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.¹⁶⁹

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 § 101 in determining patentability, viewing it as a

¹⁶⁶ *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 730–32 (2002) (explaining that clarity regarding the scope of a patent is a problem inherent in the process of establishing a patent).

¹⁶⁷ *See* *Atlantio Works v. Brady*, 107 U.S. 192, 200 (1883); Jaconda Wagner, *Patent Trolls and the High Cost of Litigation to Business and Start-Ups—A Myth?*, 45 MD. BAR J. 12 (2012) (explaining the meaning of the term “patent troll”).

¹⁶⁸ *See* Francisc Marius Keeley-Domokos, *State St. Bank & Trust Co. v. Signature Financial Grp., Inc.*, 14 BERKELEY TECH. L.J. 153, 168–69 (1999) (stating that business methods can be patentable, but must be more than merely useful).

¹⁶⁹ *See id.* (comparing business method innovation to technological innovation, which is broadly permitted protection under patent law).

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nominal threshold inquiry.¹⁷⁰ 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 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," § 101. Those requirements include that the invention be novel, see § 102, nonobvious, see § 103, and fully and particularly described, see § 112.¹⁷¹

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 to any and all limitations over subject matter eligibility.¹⁷²

1. The Scope Limitation Approach¹⁷³

The scope limitation approach is nothing like a traditional gatekeeping approach. Rather than viewing § 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 other validity doctrines have been exhausted."¹⁷⁴ "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."¹⁷⁵ Theoretically, under this minimal subject matter approach, many unwarranted inventions could be excluded from patent protection without ever being examined under § 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.

Professors Lemley, Risch, Sichelman, and Wagner's scope limitation approach focuses on interpreting the rule against

¹⁷⁰ *Bilski v. Kappos*, 130 S. Ct. at 3225.

¹⁷¹ *Id.*

¹⁷² Lemley et al., *supra* note 8, at 1315, 1317.

¹⁷³ *Id.* at 1328.

¹⁷⁴ *Id.* at 1342.

¹⁷⁵ *Id.*

patenting abstract ideas.¹⁷⁶ Observing that there is no clear distinction between patentable subject matter and unpatentable abstract ideas, these professors suggest a new way to understand the common law abstract idea exception.¹⁷⁷ According to their theory, the abstract idea exception purports:

[T]o 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.¹⁷⁸

The scope limitation approach correctly contends that traditional gatekeeping approaches engage in a pointless effort to fit inventions into permissible and impermissible categories.¹⁷⁹ 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 “overexclude and underexclude in a costly and haphazard way.”¹⁸⁰ 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.¹⁸¹

Under the scope limitation approach, claims are permissible when they are “commensurate with a practical, real world contribution.”¹⁸² 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

¹⁷⁶ *Id.* at 1328.

¹⁷⁷ *Id.*

¹⁷⁸ Lemley et al., *supra* note 8, at 1317.

¹⁷⁹ *Id.* at 1326.

¹⁸⁰ *Id.* at 1327.

¹⁸¹ *Id.*

¹⁸² *Id.* at 1339.

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overbroad patent may be less in a slow-moving industry than in fast-moving one); the fact that a patentee claims a 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).¹⁸³

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.¹⁸⁴ 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.¹⁸⁵ 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.¹⁸⁶ Objecting all previously developed tests for determining subject matter eligibility as

¹⁸³ *Id.* at 1339–41.

¹⁸⁴ Lemley et al., *supra* note 8, at 1341–42.

¹⁸⁵ *See generally*, Risch, *supra* note 28 (arguing for an approach that would allow for broader patentability).

¹⁸⁶ *Id.* at 606–09.

unsupportable statutory interpretations of the Patent Act, Risch's "everything is patentable" approach advocates a rigorous application of the Patent Act's patentability criteria.¹⁸⁷

The most revolutionary aspect of this approach is the proposition suggesting that even the common law exceptions to patentable subject matter should be abandoned.¹⁸⁸ To support this radical assertion, Risch argues that judges lack the empirical information necessary to make subject matter policy.¹⁸⁹ 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.¹⁹⁰ Finally, Risch contends that judges should not be responsible for legislating patent eligibility beyond the categories defined by Congress.¹⁹¹ 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."¹⁹² 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.¹⁹³

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,"¹⁹⁴ 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-defined,

¹⁸⁷ *Id.* at 594. Specifically, according to Risch, § 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." *Id.* at 607.

¹⁸⁸ *Id.* at 637–38.

¹⁸⁹ *Id.* at 595.

¹⁹⁰ Risch, *supra* note 28, at 645–46.

¹⁹¹ *Id.* at 595.

¹⁹² *Id.* at 594.

¹⁹³ *Id.*

¹⁹⁴ *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)).

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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.¹⁹⁵

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 dependent on unsettled interpretations of the three common law exceptions, it lacks clarity and certainty.¹⁹⁶ Nevertheless, because a great gatekeeping potential is inherent to the doctrine of subject matter eligibility,¹⁹⁷ 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 § 101’s gatekeeping role?

This section attempts to answer this question,¹⁹⁸ 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.¹⁹⁹

¹⁹⁵ *Id.* at 649–52.

¹⁹⁶ See Risch, *supra* note 28, at 637 (discussing potential criticisms of judicial common law limitations).

¹⁹⁷ Eileen M. Kane, *Patent Ineligibility: Maintaining A Scientific Public Domain*, 80 ST. JOHN’S L. REV. 519, 553 (2006) (explaining that a gatekeeping role for the patentable subject matter inquiry is legitimately inferred from its place in the numbering of statutory requirements for a patent as 35 U.S.C. § 101).

¹⁹⁸ 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.

¹⁹⁹ 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. Risch, *supra* note 28, at 591; Crouch & Merges, *supra* note 30, at 1673; Duffy, *supra* note 23, at 623; Osenga, *supra* note 30, 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”).

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, § 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,²⁰⁰ there is a real problem of retrieving invalidating prior art necessary to execute a novelty or non-obviousness rejection.²⁰¹ First of all, patent examiners suffer from deficient access to adequate information about relevant prior art,²⁰² 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 could be tracked. In effect, the examiner is limited to internal sources available at the office.²⁰³

Second, even when relevant prior art is retrieved, patent examiners have depleted ability to apply it effectively.²⁰⁴ Most

²⁰⁰ For illustration, suffice to mention couple of examples: a patent awarded to a five-year-old boy for "Method of Swinging on a Swing" (U.S. Patent No. 6,368,227 (filed Nov. 17, 2000)) and a patent on a method for drafting a patent (Machine for Drafting a Patent Application and Process for Doing Same, U.S. Patent No. 6,574,645 (filed Feb. 19, 2002)). See Daniel Wright, *The Humor of Invention*, PATENTLY SILLY (last visited Nov. 17, 2012) <http://www.patentlysilly.com> (describing dozens more examples).

²⁰¹ 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. See Noveck, *supra* note 31, at 132 (discussing "prior art").

²⁰² *Id.*

²⁰³ *Id.* at 135.

²⁰⁴ *Id.* at 132.

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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).²⁰⁵ 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 2010 490,226 utility applications were filed),²⁰⁶ and you will inevitably conclude that examiners do not have time for an adequate search of relevant prior art.²⁰⁷ 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 art²⁰⁸ (either § 102 prior art or § 103 obviousness grounds), suggesting that in many cases not all relevant prior art is being considered during examination of a patent application.²⁰⁹

These concerns are especially noticeable in emerging fields of innovation, such as software, information technology, and biotechnology.²¹⁰ Indeed, the fact that many software improvements are not researchable *at all* in the literature bolsters the information deficient.²¹¹ While some improvements may be documented via developer specifications or online FAQs, the source code itself is almost never released.²¹² Additionally, while patent examiners focus mainly on the U.S. patent database

²⁰⁵ *Id.*

²⁰⁶ U.S. PATENT AND TRADEMARK OFFICE, PATENT STATISTICS, CALENDAR YEARS 1963–2011 (2012), *available at* http://www.uspto.gov/web/offices/ac/ido/oeip/taf/us_stat.pdf; Graf, *supra* note 33, at 502.

²⁰⁷ *See* Graf, *supra* note 33, at 502 (describing both the volume of patent requests and the time restraints placed on patent officers).

²⁰⁸ John R. Allison & Mark A. Lemley, *Empirical Evidence on the Validity of Litigated Patents*, 26 AIPLA Q.J. 185, 208 (1998).

²⁰⁹ *Id.*

²¹⁰ Julie E. Cohen & Mark A. Lemley, *Patent Scope and Innovation in the Software Industry*, 89 CAL. L. REV. 1, 42 (Jan. 2001).

²¹¹ *Id.*

²¹² *Id.*

in searching for prior art,²¹³ in “new” fields of innovation, there are relatively few patents issued as yet.²¹⁴ 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.²¹⁵ 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).²¹⁶

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.²¹⁷ 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.²¹⁸

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

Economic analysis also suggests that subject matter eligibility is the statutory mechanism having the best potential to exclude

²¹³ Graf, *supra* note 33, at 502–03; Bhaven N. Sampat, Determinants of Patent Quality: An Empirical Analysis 8 (Sept. 2005), available at <http://www.immagic.com/eLibrary/ARCHIVES/GENERAL/COLUMBIA/C050902S.pdf> (comparing patent examiners’ use of U.S. patents to their use of foreign patents).

²¹⁴ See Merges, *supra* note 7, at 589 (describing problems with patent availability in emerging fields of technology).

²¹⁵ *Id.*

²¹⁶ See Eli Kintisch, *US Patent Policy: PTO Wants to Tap Experts to Help Examiners*, SCIENCE, May 19, 2006, at 982.

²¹⁷ Graf, *supra* note 33, at 502–04; Merges, *supra* note 7, at 589–90; Noveck, *supra* note 31 (outlining the difficulties associated with identifying and retrieving prior art).

²¹⁸ See Graf, *supra* note 33, at 499–500 (noting that without access to any potentially invalidating prior art, examiners would have no grounds to deny an application).

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unwarranted patents. Apparently, excluding unwarranted patents on subject matter grounds is the cheapest statutory mechanism of exclusion.²¹⁹ 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.²²⁰ 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.²²¹ Indeed, in order to raise a winning validity challenge based on anticipation or non-obviousness a thorough search of invalidating prior art is necessary.²²² Often times, this search will involve several different countries, with documents written in many different languages.²²³ 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.²²⁴

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,”²²⁵ 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.²²⁶ While the initial prior art search is

²¹⁹ See *infra* Part III.C.

²²⁰ Graf, *supra* note 33, at 512.

²²¹ *Id.* Attacks based on prior art require significantly more time-consuming discovery and investigation, which results in higher costs.

²²² Cohen & Lemley, *supra* note 210, at 12–13; Noveck, *supra* note 31, at 134.

²²³ See Noveck, *supra* note 31, at 134–35 (describing the search process, including the occasional necessity of consulting foreign sources).

²²⁴ See *supra* Part III.A (illustrating the skills required for successful prior-art searches).

²²⁵ See Robert L. Risberg, *Patentability Search (Patent Novelty Search)*, PRIORARTSEARCH.COM (Dec. 21, 2011, 11:08 AM), <http://www.priorartsearch.com/patentability.htm> (last visited Feb. 3, 2013) (describing patent prior art searches); Robert Platt Bell, *Prior Art Searches*, ROBERT PLATT BELL BLOG (Jan. 03, 2009, 08:51 AM), <http://robertplattbell.blogspot.com/2009/01/prior-art-searches.html> (last visited Feb. 3, 2013) (describing further the use of prior art searches).

²²⁶ See Robert L. Risberg, *Patent Validity Search or Patent Invalidity Search*, PRIORARTSEARCH.COM (Dec. 21, 2011, 11:08 AM), <http://www.priorartsearch.com/validity.htm> (last visited Feb. 3, 2013)

rather conservative and totally voluntary,²²⁷ with estimated costs of \$700 to \$1000,²²⁸ depending upon the complexity of the technology, a validity search is necessarily pedantic, resulting with extremely high expenses.²²⁹ Because every issued patent enjoys the presumption of validity, 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.²³⁰

Plenty of data as to the general costs of patent litigation and the specific costs of discovery exist.²³¹ 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.²³²

(describing validity searches).

²²⁷ See Howard M. Eisenberg, *Patent Law You Can Use™ Patentability Searching*, YALE UNIVERSITY OFFICE OF COOPERATIVE RESEARCH (2000), available at <http://www.yale.edu/ocr/pfg/guidelines/docs/patentability.pdf> (suggesting that people should conduct a prior art search although it is not a legal requirement).

²²⁸ See Bill Richards, Comment to *Cost of Prior-Art Search*, THE INTELLECTUAL PROPERTY LAW SERVER (June 06, 2006, 05:08 AM), <http://www.intelproplaw.com/Forum/Forum.cgi?bwhatispatentable;action=display;num=1149652051> (last visited Feb. 3, 2013) (describing the costs of basic prior art searches); Matthew R. Osenga, *Prior Art Searches*, INVENTIVE STEP (April 19, 2010, 11:01 AM), <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). *But see*, BAY AREA INTELLECTUAL PROPERTY GROUP, <http://www.bayareaip.com/services/searches/patent/patent.htm> (last visited Feb. 3, 2013) (stating that prior art search packages for small businesses with fewer than 50 employees, start-ups, and individuals is only \$250).

²²⁹ See DIGITAL PATENT SERVICES CORP., http://www.dpsfiles.com/ip_search_services.php (last visited Feb. 3, 2013) (describing how validity searches can range in price between \$500 and \$10,000).

²³⁰ 35 U.S.C.A. § 282(a) (West, Westlaw through P.L. 112-207 approved 12/7/12). *See also* Eisenberg, *supra* note 228 (describing the burden of finding prior patent art that invalidates a patent).

²³¹ See Christopher B. Seaman, *Willful Patent Infringement and Enhanced Damages After in Re Seagate: An Empirical Study*, 97 IOWA L. REV. 417, 422 (2012) (discussing findings of a 2009 report from the American Intellectual Property Law Association that patent suits between \$1 million and \$25 million incurred a \$2.7 million cost of litigation and that cases over \$25 million had costs over \$6 million); IE DISCOVERY, INC., *Discovery Expenditures During Litigation*, http://www.iediscovery.com/files/resources/Discovery_Cost_Percent_0307.pdf (last visited Feb. 3, 2013) (listing various sources describing the cost of discovery during litigation).

²³² See Graf, *supra* note 33, at 501–02 (explaining that “prior art is a major contributor to findings of invalidity”).

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Several patent litigators from prestigious law firms have estimated that these costs should be at minimum \$10,000 and up.²³³ Different circumstances, however, may cause these expenses to skyrocket.²³⁴ For instance, it matters who the defendants are – do they represent a major corporation whose business is threatened by a new, patented product? Additionally, it is relevant who the patent holders are – 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).²³⁵ 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. the size of the market, the market share per producer, 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 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.²³⁶ Take for example, Global Prior Art, Inc., which offers comprehensive litigation support to engineering and life science projects, among other research and analysis services.²³⁷ Specifically, it provides: (1) customized search strategies based on the technology and aligned with client's goals; (2) manual class-based review of U.S. and/or foreign patents and applications; (3) comprehensive coverage of non-patent literature, including conference proceedings,

²³³ Based on interviews conducted with several practitioners.

²³⁴ See Peter C. Schechter, *Cutting the Costs of Patent Litigation*, N.Y.L.J. (June 11, 2012) http://www.newyorklawjournal.com/PubArticleNY.jsp?id=1202558306621&Cutting_the_Costs_of_Patent_Litigation (discussing some of the reasons for increases in litigation costs).

²³⁵ See Harry Surden, *Efficient Uncertainty in Patent Interpretation*, 68 WASH. & LEE L. REV. 1737, 1755–56 (2011) (discussing possibilities affecting costs for patent interpretation).

²³⁶ GLOBAL PRIOR ART, INC., <http://www.globalpriorart.com/expertise> (last visited Feb. 3, 2013) (stating that the company's expertise "is based on a combination of deep technical understanding and years of hands-on IP experience.").

²³⁷ *Id.*

monographs, and theses; (3) access to world class libraries and technical holdings; and (4) the closest references containing the targeted claim elements and technology.²³⁸

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.²³⁹ 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.²⁴⁰

Note that this assertion should remain applicable under this article's proposed additions to the doctrine of subject matter eligibility. As explained henceforth, 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.²⁴¹ 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.²⁴² Reviving § 101's gatekeeping function is, thus, economically justified as means of reducing litigation costs. Therefore, this article will recommend adding to the three common law exceptions two additional well-defined requirements for subject matter eligibility that are

²³⁸ GLOBAL PRIOR ART, INC., <http://www.globalpriorart.com/services/litigation-support> (last visited Feb. 3, 2013).

²³⁹ See DIGITAL PATENT SERVICES CORP., *supra* note 229 (inferring that researching prior art required to proceed with an invalidity suit is costly).

²⁴⁰ See *supra* note 112 and accompanying text (describing the creative approach thought to be needed to properly decide subject matter ineligibility suits).

²⁴¹ See *infra* pp. 402–07 (discussing how patentees would be more knowledgeable about their own patents due to these recommendations, and the information that will be needed to prove eligibility should be readily available to the patentee without requiring unreasonable effort).

²⁴² See *supra* pp. 377–79 and notes 242–43 (discussing how challenging validity based on prior art requires more invasive prior art searches than does challenging validity based on subject matter eligibility).

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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 Lemley'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."²⁴³ 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.²⁴⁴ 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.²⁴⁵

*C. The Normative Aspect: Subject Matter Eligibility Is
The Only Statutory Mechanism Capable Of
Excluding Unwarranted Patents That Are Nonetheless
Novel, Nonobvious And Adequately Described*

Some inventions are unworthy of patent protection, albeit their

²⁴³ Lemley, *supra* note 33, at 1497.

²⁴⁴ See Allison & Lemley, *supra* note 208, at 231–32 (discussing how uncited prior art references that an examiner may not have utilized in the prosecution process are more likely to affect patent litigation than prior art references that were used).

²⁴⁵ See David M. Trubek et al., *The Costs of Ordinary Litigation*, 31 UCLA L. REV. 72, 119–21 (1983) (discussing types of social cost incurred by litigation and the costs associated with litigation); See also Judge T.S. Ellis, III, *Presentation: Distortion of Patent Economics by Litigation Costs*, in CASRIP SYMPOSIUM PUBLICATION SERIES NUMBER 5 at 22, 23 (Jul. 2000), available at <http://www.law.washington.edu/casrip/symposium/Number5> (explaining that as the patent examination system remains "porous," the costs of litigating unworthy patents is high).

novelty, non-obviousness and adequate disclosure. While most of them seem of doubtful value, some of them are economically important.²⁴⁶ 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.”²⁴⁷ 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.²⁴⁸ 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.²⁴⁹ 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

²⁴⁶ See, e.g., Method of Playing a Bowling Game, U.S. Patent No. 6,142,880 (filed Nov. 7, 2000) (describing an unconventional method for bowling); See also FREE PATENTS ONLINE, *Crazy Patents!*, <http://www.freepatentsonline.com/crazy.html> (last visited Feb. 3, 2013) (detailing other patents with possible economic value that may be unworthy of patent protection); *Open a Business*, BOWLERSJOURNAL.COM INTERNATIONAL, http://www.bowlersjournal.com/?page_id=200 (last visited Feb. 3, 2013) (promoting expansion of bowling businesses and providing favorable statistics to profitability of such a business).

²⁴⁷ Graf, *supra* note 33, at 496.

²⁴⁸ See Olson, *supra* note 3, at 201–02 (arguing for a traditional gatekeeping approach to subject matter eligibility where a “most efficient patent regime is one that starts by determining initially, on a category-by-category basis, whether classes of inventions should be patentable. If it is determined that a class of inventions needs the incentive of the patent grant, then the other tests for patentability . . . should be applied.”). This article, however, addresses the problem of patents issuing over inventions that do not need the incentive of the patent grant and specifically proposes that such patents should be identified and excluded on a case-by-case basis according to clear and specific criteria.

²⁴⁹ Cohen & Lemley, *supra* note 210, at 14.

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inventive space, and as a result stifle innovation.²⁵⁰ Nevertheless, over-breadth and uncertain scope can be theoretically addressed by the abstract ideas exception,²⁵¹ or by the statutory requirements of § 112.²⁵² 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.²⁵³ Novelty, utility, non-obviousness, adequate disclosure, and even the common law exceptions to patent eligibility are not directly linked to these characteristics.²⁵⁴

It is true that patent laws were created in the first place to incentivize innovation and promote the progress of useful arts.²⁵⁵ 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.”²⁵⁶ Nevertheless, innovation independent of patent protection is not a recognizable ground for rejecting a patent application.²⁵⁷ Similarly, a patent application cannot be simply rejected for lacking any intended commercial use.²⁵⁸ 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.²⁵⁹ Not only that it is the most practical and economically efficient mechanism to exclude unworthy patents, it

²⁵⁰ *See id.* at 14–15 (describing how the prospect theory would allow for broad acquisition of rights in the technology arena).

²⁵¹ *See* Lemley et al., *supra* note 8, at 1315 (suggesting viewing subject matter eligibility as a limitation over claim scope).

²⁵² Eisenberg, *supra* note 227, at 59.

²⁵³ This is not just a simple requirement of utility. *See* Olson, *supra* note 3, at 181 (discussing the utilitarian policies that underlay patent law).

²⁵⁴ *See id.* at 195 & n.47 (discussing novelty, utility, and nonobviousness).

²⁵⁵ U.S. CONST. art. I, § 8, cl. 8.

²⁵⁶ Olson, *supra* note 3, at 183.

²⁵⁷ *See id.* at 186 & n.12 (discussing innovation and grounds for rejecting patent applications).

²⁵⁸ *Id.* at 189.

²⁵⁹ *See id.* at 183–84 (“It is . . . troubling that the current law in the United States regarding what types of inventions are eligible for patenting (patentable subject matter) has developed with little explicit consideration of the utilitarian question that should guide our crafting of patent law, and especially of the determination of which subject matter should be patentable.”).

is the only statutory mechanism that can potentially exclude such patents.²⁶⁰

1. Inventions Whose Development is Not Dependent on the Patent Act's Pecuniary Incentives

What is striking about patents whose development is not dependent on the patent act's 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."²⁶¹ 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.²⁶²

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."²⁶³ 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.²⁶⁴ This price is *de facto* higher than the alternative competitive price.²⁶⁵ 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.²⁶⁶ As a result, some

²⁶⁰ See *id.* at 184–85 (explaining that such a utilitarian approach to patent law will prevent "market failures," which have been perpetuated by the courts' allowance of a "breathtaking expansion of patentable subject matter in the last few decades"). In its final part, this article will suggest clear criteria to be considered under § 101 in order to fully exploit its gatekeeping potential and exclude unwarranted patents. See *infra* Part IV.

²⁶¹ *Patent-Eligible Subject Matter*, *supra* note 18, at 376–77 (emphasis added).

²⁶² Olson, *supra* note 3, at 193–94.

²⁶³ *Id.*; Cohen & Lemley, *supra* note 210, 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).

²⁶⁴ Olson, *supra* note 3, at 193.

²⁶⁵ *Id.* at 197.

²⁶⁶ Steve P. Calandrillo, *An Economic Analysis of Intellectual Property Rights: Justifications and Problems of Exclusive Rights, Incentives to Generate Information, and the Alternative of a Government-Run Reward System*, 9

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of the surplus that would exist in a competitive market is lost.²⁶⁷ This lost surplus, referred to as the “deadweight loss’ . . . from monopoly, *is* a source of inefficiency.”²⁶⁸

A patent, as a type of monopoly, affords its owner with the sole right to exclude others from making, selling, using, or licensing the underlining invention.²⁶⁹ 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.²⁷⁰ 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.²⁷¹

To justify the grant of patent rights, these monopoly costs must be outweighed by the social benefit of increased innovation.²⁷² 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.²⁷³ “The returns from inventing are the revenues an inventor can gain from selling, licensing, or using her invention.”²⁷⁴ 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.²⁷⁵ Thus, “the rational producer will not expend resources to invent in a competitive market when she cannot make back the cost of her investment in inventing.”²⁷⁶ Economists refer to this problem as the “public goods problem” and suggest solving it by subsidizing the production of under-produced goods.²⁷⁷ Appropriately, patent law

FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 301, 304 (1998).

²⁶⁷ *Id.* at 303–05.

²⁶⁸ Olson, *supra* note 3, at 197.

²⁶⁹ *Id.* at 192–93.

²⁷⁰ *Id.* at 193.

²⁷¹ Calandrillo, *supra* note 266, at 304–05.

²⁷² Louis Kaplow, *The Patent-Antitrust Intersection: A Reappraisal*, 97 HARV. L. REV. 1813, 1824–25 (1984).

²⁷³ *See id.* at 1823–24 (outlining the benefits that the patent system has in increasing rewards to patentees thus encouraging inventive activity).

²⁷⁴ Olson, *supra* note 3, at 195.

²⁷⁵ *Id.* at 182–83.

²⁷⁶ *Id.* at 196–97.

²⁷⁷ *Id.*

subsidizes innovation through the grant of patents, which afford inventors “the exclusive right to control their invention for twenty years.”²⁷⁸ In this way, our patent system ensures the constant “[p]rogress of [s]cience and useful [a]rts.”²⁷⁹

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

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.²⁸⁰ This occurs precisely when a prospected invention is not subject to a public goods problem because other factors exist that adequately incentivize its development.²⁸¹ One such factor could be the inventor’s personal benefit from the invention.²⁸² 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.²⁸³ 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, “[i]n a highly competitive market, a firm that offers even a slight drop in price or improvement in service reaps large gains in extra sales, and thus large gains in revenue.”²⁸⁴ These alone may be sufficient to incentivize such self-consuming innovation.²⁸⁵

Another important factor that can possibly incentivize innovation is the availability of other legal protections, such as

²⁷⁸ *Id.* at 197.

²⁷⁹ U.S. CONST. art. I, § 8, cl. 8.

²⁸⁰ Olson, *supra* note 3, at 193–94.

²⁸¹ *Id.* at 203.

²⁸² See Calandrillo, *supra* note 266, at 305–06 (listing personal benefits that might incentivize an inventor); See also Lloyd L. Weinreb, *Copyright for Functional Expression*, 111 HARV. L. REV. 1149, 1226 (1998) (discussing those who work “for their own pleasure”).

²⁸³ Alan Devlin & Neel Sukhatme, *Self-Realizing Inventions and the Utilitarian Foundation of Patent Law*, 51 WM. & MARY L. REV. 897, 898, 927–28 (2009).

²⁸⁴ Olson, *supra* note 3, at 228.

²⁸⁵ Devlin & Sukhatme, *supra* note 283, at 930–33.

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trade secret law.²⁸⁶ To achieve trade secret status, the inventor must implement specific confidentiality and security requirements.²⁸⁷ 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.”²⁸⁸ The firm also implements non-compete agreements to prevent employees from forwarding such trade secrets to competitors after their employment is terminated.²⁸⁹ Consequently, the firm obtains semi-monopoly protection, “without any foray into the patent application process.”²⁹⁰ When applicable, trade secret law may be preferable to patent law. First, it allows parties to “establish their own levels of protection for each trade secret” according to their internal analysis of their invention costs and benefits.²⁹¹ Second, it is not dependent 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.²⁹²

The alternative protection afforded by trade secret law becomes relevant especially in instances where reverse engineering the invention is highly complex.²⁹³ With self-consuming inventions, for example, the possibility of reverse engineering is rather difficult because such inventions are initially designed to benefit the inventor.²⁹⁴ In particular, such “inventions are often invisible to competitors, and hence the cost of reverse-engineering them is higher than standard inventions.”²⁹⁵ Competitors cannot simply purchase the invention, because the invention is not to be found in stores.²⁹⁶ To

²⁸⁶ Mark A. Lemley, *The Surprising Virtues of Treating Trade Secrets as IP Rights*, 61 *Stan. L. Rev.* 311, 330 (2008).

²⁸⁷ These vary from state to state. See Christopher Rebel J. Pace, *The Case for a Federal Trade Secrets Act*, 8 *HARV. J.L. & TECH.* 427, 443–44 (1995) (discussing the lack of uniformity in this area).

²⁸⁸ Olson, *supra* note 3, at 229.

²⁸⁹ *Id.* at 229. See also *id.* at 196 n.53 (discussing the use of contracts to prevent employees from revealing trade secrets).

²⁹⁰ *Id.* at 229.

²⁹¹ *Id.* at 229–30.

²⁹² *Id.*

²⁹³ Olson, *supra* note 3, at 231; Devlin & Sukhatme, *supra* note 283, at 931.

²⁹⁴ Olson, *supra* note 3, at 231–32; Devlin & Sukhatme, *supra* note 283, at 931.

²⁹⁵ Devlin & Sukhatme, *supra* note 283, at 931.

²⁹⁶ See *id.* (discussing the hidden nature of this type of invention).

reverse engineer the invention, competitors need inside information on how the invention operates.²⁹⁷ Yet, obtaining such information is quite a difficult task, in light of “noncompete agreements and legal sanctions . . . [that] discourage this kind of behavior.”²⁹⁸

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.²⁹⁹

A different possible factor that may incentivize innovation could be the social incentive of reputation.³⁰⁰ This type of incentive is mostly relevant to academic settings, where professional success is evaluated according to the degree of inventiveness.³⁰¹ 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.”³⁰² 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; especially 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.³⁰³

²⁹⁷ *Id.*

²⁹⁸ *See id.* (discussing the sanctions that exist to discourage dishonest or underhanded means of obtaining information).

²⁹⁹ *See id.* (discussing the protections a company is afforded under trade secret law for this type of invention).

³⁰⁰ *See id.* at 925–26 (discussing social incentives to invent).

³⁰¹ Devlin & Sukhatme, *supra* note 283, at 925–27 (discussing social incentives in academic settings).

³⁰² *See id.* (discussing publication of new ideas for career purposes as the motivating factor in academic settings).

³⁰³ *See id.* at 926 (discussing the different perspectives on monetary draw for academic researchers); see Peter Mikhail, *Hopkins v. CellPro: An Illustration That Patenting and Exclusive Licensing of Fundamental Science is Not Always in the Public Interest*, 13 HARV. J.L. & TECH. 375, 375–76 (2000) (suggesting that patents have replaced publication as an incentive in the university setting).

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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.³⁰⁴ 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.³⁰⁵ 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.³⁰⁶ 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.³⁰⁷ 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."³⁰⁸

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.³⁰⁹ 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 inventions.³¹⁰ Since no "public goods" problem actually exists with respect to such inventions, our patent system must not violate the rule of free competition and refrain from subsidizing

³⁰⁴ See Pace, *supra* note 288, at 436 ("If an innovation could be developed at little or no cost to the company desiring the innovation, then each company would have all the incentive it needed to undertake such a development.")

³⁰⁵ See *id.* (discussing the loss of motivation if it is not possible to recoup the expenses spent to innovate).

³⁰⁶ See Devlin & Sukhatme, *supra* note 283, at 921, 951 (suggesting that there is no need for incentive when no pecuniary resources were necessary for innovation).

³⁰⁷ See *id.* at 927–28 (discussing increased utility as "an independent incentive to invent").

³⁰⁸ *Seymour v. Osborne*, 78 U.S. 516, 533–34 (1870); see Devlin & Sukhatme, *supra* note 283, at 930–31, 933 (discussing the diminished need for patent rights in this situation).

³⁰⁹ See Devlin & Sukhatme, *supra* note 283, at 953–54 (indicating that incentives exist for innovation which lack a pecuniary reward).

³¹⁰ *Id.* at 951, 954–55.

the inventors through the grant of patent rights.³¹¹ Otherwise, the *ex post* costs of short-term monopoly will improperly exceed the benefits of higher *ex ante* incentives to innovate, causing overall inefficiency.³¹²

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.³¹³ 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.³¹⁴

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 § 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 § 101’s gatekeeping function.

³¹¹ *Id.* at 951–54.

³¹² *Id.* at 953–54.

³¹³ *See* Olson, *supra* note 3, at 189 (indicating that useless patents are secured by entities known as patent trolls. The tactics of such entities will be addressed henceforth).

³¹⁴ *Id.*

2013] GATEKEEPING & SUBJECT MATTER ELIGIBILITY 289**a. Why Should We Exclude Patents Having No Intended Commercial Use?**

Again, patents exist to promote the progress of science and useful arts.³¹⁵ Although they unavoidably block subsequent dependent innovation during the limited time of exclusiveness granted to their owners,³¹⁶ 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.³¹⁷ 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.”³¹⁸ 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.³¹⁹ 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 evolution into a commercially beneficial product would be ensured and the public's overall welfare would incline.³²⁰

Indeed, were costly and uncertain commercialization efforts

³¹⁵ U.S. CONST. art. I, § 8, cl. 8.

³¹⁶ See Michael Risch, *Reinventing Usefulness*, B.Y.U. L. REV. 1195, 1223–25 (2010) (discussing the blocking effect patents have on subsequent inventions).

³¹⁷ See discussion *infra* pp. 385–90.

³¹⁸ See Risch, *supra* note 316, at 1224–25 (quoting Ted Sichelman, *Commercializing Patents*, 62 STAN. L. REV. 341, 344 (2010)) (discussing the effects of patents on researchers' ability to maximize the usefulness of patented items).

³¹⁹ Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 870–71 (1990).

³²⁰ 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.”).

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,”³²¹ and thus would not be capable of invalidating the patent when done before the patent filing.³²² 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.³²³

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, i.e. the social costs imposed by the examination procedure of patent applications, outweigh the prospected social benefits of the invention.³²⁴ 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.³²⁵

Consider, for example, the patent issued for a “Dining Table Having Integral Dishwasher.”³²⁶ When presenting this example in his article “Reinventing Usefulness,” Professor Risch explains that,

[I]t would likely be difficult to show 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

³²¹ See Risch, *supra* note 316, at 1247 (discussing commercial usefulness).

³²² See *In re Smith*, 714 F.2d 1127, 1137 (Fed. Cir. 1983) (explaining that a carpet fresh patent was invalid due to public market testing).

³²³ Risch, *supra* note 316, at 1248-49.

³²⁴ See Merges & Nelson, *supra* note 319, at 842, 870–71 (discussing “deadweight loss”).

³²⁵ See Risch, *supra* note 316, at 1246–47 (discussing the need for an experimental use period).

³²⁶ U.S. Patent No. 5,687,752 (filed Nov. 15, 1995).

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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.³²⁷

Granting patents over silly inventions such as the dining table/dishwasher does not increase public welfare.³²⁸ Since an invention's usefulness indicates social welfare, when an invention is useless, society reaps no benefit.³²⁹ 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.³³⁰ This is especially true if we take into account the fact that a relatively small percentage of patents are ever licensed or litigated.³³¹ As noted formerly, this article is concerned about patents that are not only bad, but also valuable. Silly patents, however, are senseless and 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,"³³² notably information technology ("IT"), which negatively effects public welfare. Patenting mere components (and not end products) that are crucial for the development of other end products and demanding un-proportional licensing fees for the permission to exploit them is an undesired tactic carried

³²⁷ Risch, *supra* note 316, at 1247.

³²⁸ 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)).

³²⁹ See Michael Risch, *A Surprisingly Useful Requirement*, 19 GEO. MASON L. REV. 57, 63 (2011) [hereinafter *A Surprisingly Useful Requirement*] (discussing the usefulness of patented items).

³³⁰ See Risch, *supra* note 316, at 1224-25 (indicating that patents on potentially useful products may detract from public benefits).

³³¹ Lemley, *supra* note 3, at 1495 (indicating attacks on the USPTO that allege a failure to take its duty seriously, subsequently allowing "bad patents to slip through the system").

³³² See Mark A. Lemley, *Are Universities Patent Trolls?*, 18 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 611, 613 (2008) [hereinafter *Are Universities Patent Trolls?*].

out by entities often referred to as “patent trolls.”³³³ 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.³³⁴ “The threat that [the] patent holder[s] 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 injunction is based on a patent covering one small component of a complex, profitable, and popular product.”³³⁵ “[When] the defendant has already invested heavily to design, manufacture, market, and sell the product with the allegedly infringing feature[s]” these “threats involve a strong element of holdup” “enable[ing] patent holders to negotiate royalties far in excess of the patent[s] . . . [real] economic contribution.”³³⁶

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.³³⁷ 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 disproportionate share of Intel’s product.³³⁸ 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 until it can design a new chip that avoids infringing that patent.”³³⁹ Needless to say that this

³³³ See *id.* (discussing the fact that some refer to this behavior as patent “hold-up.”). See also Brenda Sandburg, *You May Not Have a Choice. Trolling for Dollars*, THE RECORDER (July 30, 2001), <http://www.phonetel.com/pdfs/LWTrolls.pdf> (stating 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.”).

³³⁴ The literature often refers to these situations as “royalty stacking.” See Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 1992–93 (2007) (explaining the term “royalty stacking” and the problems it creates).

³³⁵ See *id.* (discussing the threat to patent holders).

³³⁶ *Id.* at 1993.

³³⁷ *Are Universities Patent Trolls?*, *supra* note 332, at 613.

³³⁸ See *id.* (discussing the amount of value that patent trolls can take from a legitimate product). See also Lemley & Shapiro, *supra* note 334, at 2008.

³³⁹ *Are Universities Patent Trolls?*, *supra* note 332, at 613. See 35 U.S.C.A. § 281 (West, Westlaw through P.L. 112-207 approved 12/7/12) (discussing the

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“might take years and require investing billions of dollars”³⁴⁰

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.³⁴¹ Released from un-proportional 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.

b. The Patent Act’s Utility Requirement Does Not Require Commercial Utility

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,’³⁴² and even if it is not commercially useful at all.”³⁴³ 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 product.”³⁴⁴ “Patent law provides the inventor with a monopoly right to exclude others from using, selling, making, or practicing the invention, but does not impose a concomitant obligation to do the same.”³⁴⁵ In fact, all that is required under § 101’s utility requirement is that an invention be operable and practical. If an application

right to civil action); 35 U.S.C.A. § 283 (West, Westlaw through P.L. 112-207 approved 12/7/12) (discussing the right to injunction); 35 U.S.C.A. § 284 (West, Westlaw through P.L. 112-207 approved 12/7/12) (discussing damages).

³⁴⁰ *Are Universities Patent Trolls?*, *supra* note 332, at 613.

³⁴¹ *See* Risch, *supra* note 318, at 1242 (“Inventors of components may have more difficulty because they must 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.”).

³⁴² *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) (stating that the Utility Doctrine can still be met even though a product is designed to imitate another).

³⁴³ *A Surprisingly Useful Requirement*, *supra* note 329, at 67. This approach is often referred to as the “laissez-faire approach” to commercially viable innovation.

³⁴⁴ *Id.* at 63.

³⁴⁵ Noveck, *supra* note 31, at 131.

clears these low utility hurdles, it will be granted a patent.³⁴⁶

“Operable usefulness requires that a patented invention . . . achieve some intended result.”³⁴⁷ Un-operable inventions include inventions that violate a law of nature, i.e. perpetual-motion machines,³⁴⁸ 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.³⁴⁹

Practical utility requires that inventions “have some currently available specific and substantial use to be patentable.”³⁵⁰ “When a patent application merely speculates that an invention might be useful in some general way . . . the invention lacks specific utility.”³⁵¹ Also, “[a]n invention that provides no immediate benefit to the public . . . [requires] research to identify a real-world application and, therefore, lacks substantial utility.”³⁵² Finally, § 112 is also relevant to the requirement of practical utility because it requires inventors to disclose how to use an invention.³⁵³ Without practical utility, an “inventor cannot comply with section 112’s ‘how to use’ requirement.”³⁵⁴

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 wonder that commercially useless

³⁴⁶ See *A Surprisingly Useful Requirement*, *supra* note 329, at 63 (describing two factors in determining a patent’s usefulness).

³⁴⁷ *Id.* at 65; Risch, *supra* note 316, at 1202.

³⁴⁸ *E.g.*, *Newman v. Quigg*, 877 F.2d 1575, 1577 (Fed. Cir. 1989) (discussing an invention that violates the laws of thermodynamics); 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/mpep/mpep_e8r6_0700.pdf (discussing the qualifying categories for patents under the statute).

³⁴⁹ *A Surprisingly Useful Requirement*, *supra* note 329, at 65–66.

³⁵⁰ *Id.* at 66; *Brenner v. Manson*, 383 U.S. 519, 534–35 (1966) (“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.”).

³⁵¹ *A Surprisingly Useful Requirement*, *supra* note 329, at 66.

³⁵² *Id.*

³⁵³ 35 U.S.C.A. § 112 (West, Westlaw through P.L. 112-207 approved 12/7/12).

³⁵⁴ *A Surprisingly Useful Requirement*, *supra* note 33, at 67.

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patents constantly issue.”³⁵⁵ Accordingly, the next and last part of this article will suggest requiring proof of prospected commercial use as an additional pre-requisite of subject matter eligibility.

Even though other scholars have previously suggested considering a patent’s prospective utility³⁵⁶ or commercial utility³⁵⁷ when determining *patentability*, none of them has proposed to encompass this requirement under subject matter *eligibility*.³⁵⁸ 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, 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.³⁵⁹ While subject matter eligibility also addresses newness, inventiveness, and clarity, it does so from a normative, philosophical aspect.³⁶⁰

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.³⁶¹

³⁵⁵ Risch, *supra* note 316, at 1205.

³⁵⁶ See generally Nathan Machin, *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).

³⁵⁷ Risch, *supra* note 316, at 1240–41 (proposing a test to determine when commercial utility is present).

³⁵⁸ But see *A Surprisingly Useful Requirement*, *supra* note 329, at 111 (“Considering an invention’s usefulness can help resolve novelty, obviousness, subject matter, enablement, claim scope, and damages questions.”).

³⁵⁹ Risch, *supra* note 316, at 1203.

³⁶⁰ See *supra* Part III C.

³⁶¹ *A Surprisingly Useful Requirement*, *supra* note 330, at 75–76.

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:

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

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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.³⁶²

Proof that the *inventor* did not engage in 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 underlying 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,³⁶³ 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.

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

³⁶² See *Seymour v. Osborne*, 78 U.S. 516, 534 (1870) (discussing how patents allow inventors to recoup costs).

³⁶³ 35 U.S.C.A. § 261 (West, Westlaw current through P.L. 112-206 approved 12/7/12).

simply purchase and deconstruct it.³⁶⁴ 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.³⁶⁵

When examining a patent application or an issued patent pursuant to the above factors, patent examiners and judges should bear 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 weighed, yet the final decision should be based on the factor domineering a given case.

1. The Benefits Of Requirement Number 1

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.³⁶⁶ 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.³⁶⁷ Nonetheless, if patents are granted only in those specific instances where the patentee has no internal benefit from inventing, where other legal forms of intellectual property 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

³⁶⁴ Devlin & Sukhatme, *supra* note 283, at 931.

³⁶⁵ *Id.*

³⁶⁶ Olson, *supra* note 3, at 192–93; *see also* Cohen & Lemley, *supra* note 210, at 50 (“[D]eadweight losses imposed by the existence of the patent system are worth it.”); *see also* Eckersley, *supra* note 263, at 118 n.111 (defining deadweight loss as “any cost to society which could be relieved without harming anyone”).

³⁶⁷ Olson, *supra* note 3, at 183.

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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.³⁶⁸ This outcome alone is beneficial for several reasons. First of all, 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 fewer constraints over the 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.³⁶⁹ 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

³⁶⁸ See Cotropia, *supra* note 320, at 124 (stating that greater resource investment prior to examination reduces the number of conceived ideas that turn into examined patent applications).

³⁶⁹ Devlin & Sukhatme, *supra* note 283, at 931.

employees, they would in turn avoid the high expenses associated with filing and enforcing a patent.³⁷⁰

*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.”*³⁷¹

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 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.³⁷² The applicant is, therefore, not required to show actual production and sale of the invention. Otherwise, the on-sale and public-use bars,³⁷³ which deny patents covering inventions put to use more than a year prior to filing, would constantly repudiate patentability.³⁷⁴ 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 *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, “[t]he most sophisticated search tools, and the clearest applications and standards are unavailing if the USPTO does not hire, train, and retain talented, dedicated employees.”³⁷⁵ 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

³⁷⁰ Stuart J. H. Graham & Ted Sichelman, *Why Do Start-Ups Patent?*, 23 BERKELEY TECH. L.J. 1063, 1070, 1082 (2008).

³⁷¹ Risch, *supra* note 316, at 1240–41.

³⁷² *See id.* at 1241.

³⁷³ 35 U.S.C.A. § 102 (West, Westlaw current through P.L. 112-207 approved 12/7/12).

³⁷⁴ Risch, *supra* note 316, at 1245.

³⁷⁵ UNITED STATES PATENT AND TRADEMARK OFFICE, PATENT PUBLIC ADVISORY COMMITTEE ANNUAL REPORT, 6 (2007), available at http://www.uspto.gov/go/com/advisory/reports/ppac_2007annualrpt.pdf.

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businessman, working exclusively for the USPTO, and consequently, bounded by the same confidentiality rules that apply to all USPTO's employees,³⁷⁶ 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 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.³⁷⁷

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."³⁷⁸ 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

³⁷⁶ See 35 U.S.C.A. § 122(a) (West, Westlaw current through P.L. 112-207 approved 12/7/12) (requiring all USPTO employees to preserve pending applications for patents in confidence until they are either published or patented); see 18 U.S.C.A. § 2071 (West, Westlaw current through P.L. 112-207 approved 12/7/12) (imposing different sanctions for violations of the confidentiality requirement during the examination process).

³⁷⁷ Risch, *supra* note 316, at 1241–42.

³⁷⁸ *Id.* at 1243.

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 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 premature 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 underlying 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

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improvement.³⁷⁹

Third, inquiring whether the claimed invention can be delivered to or practiced by a sufficient market at a market-clearing price³⁸⁰ 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,”³⁸¹ 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.³⁸² 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 or 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.³⁸³ Second, requiring proof of prospective commercialization will increase the clarity of patent claims. Indeed, “[i]t will be more difficult to show manufacturability and consumer demand for abstract claims.”³⁸⁴ 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.³⁸⁵

Finally, adding an additional requirement of proof of prospective commercialization will potentially decrease overall litigation. There is no doubt that with this additional

³⁷⁹ See example *supra* pp. 389–91.

³⁸⁰ Risch, *supra* note 316, at 1242.

³⁸¹ *Id.*

³⁸² *Id.*

³⁸³ *Id.* at 1249.

³⁸⁴ *Id.*

³⁸⁵ *Id.* at 1250.

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.³⁸⁶ 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.³⁸⁷ 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 new and unpredictable wonders of human ingenuity."³⁸⁸ 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 decrease in the number of patent applications that would be filed, if the proposed requirements are adopted, should mitigate the increase in administrative costs.

³⁸⁶ See Chiang, *supra* note 115, at 1356–57.

³⁸⁷ See Risch, *supra* note 316, at 1243.

³⁸⁸ Duffy, *supra* note 23, at 610.

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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.³⁸⁹ 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.³⁹⁰

Nonetheless, it can be argued that such double patenting efforts already exist since patent applications currently remain secret for at least eighteen months.³⁹¹ Additionally, often times the inventor is the only one developing the invention, so no double efforts actually take place.³⁹² And finally, double efforts may lead to different beneficial applications, which is good for competition and innovation.³⁹³

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 the necessary technology is not published.³⁹⁴ Delaying the publication of patent applications would hence deprive others of the ability to learn from the disclosure and develop related technologies.³⁹⁵ 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.³⁹⁶

³⁸⁹ See 35 U.S.C.A. § 122(b)(1)(A)(2012) (West, Westlaw current through P.L. 112-207 approve 12/7/12) (stating that patent applications are published 18 months after filing).

³⁹⁰ Merges & Nelson, *supra* note 319, at 871.

³⁹¹ 35 U.S.C.A. § 122(a), (b)(1)(B) (West, Westlaw current through P.L. 112-207 approved 12/7/12).

³⁹² Risch, *supra* note 316, at 1253–54.

³⁹³ *Id.* at 1254; see also Cotropia, *supra* note 320, at 86 (“Two companies may be attempting to solve a given problem and, at the end of the race, produce two viable solutions.”).

³⁹⁴ Risch, *supra* note 316, at 1253.

³⁹⁵ *Id.*

³⁹⁶ *Id.* at 1250.

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.³⁹⁷ 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.³⁹⁸ In any event, according to the PTO's Data Visualization Center, it currently takes almost three years to get a patent.³⁹⁹ 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 invest more time and money in inventing.⁴⁰⁰ However, if small and independent inventors provide little additional inventive benefits and instead large companies simultaneously develop most inventions, as actually evidenced,⁴⁰¹ 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.⁴⁰²

Finally, it may be contended that adopting the proposed requirements would entail litigants to spend more on research

³⁹⁷ *Id.* at 1251.

³⁹⁸ *Id.* at 1250.

³⁹⁹ *Data Visualization Center*, U.S. PATENT AND TRADEMARK OFFICE (last visited Feb. 3, 2013), <http://www.uspto.gov/about/stratplan/dashboards.jsp>.

⁴⁰⁰ *See* Risch, *supra* note 316, at 1248–49.

⁴⁰¹ 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 high value inventions).

⁴⁰² Risch, *supra* note 316, at 1252.

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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 guidelines that will assist patent applicants and potential defendants to prepare the necessary evidence more efficiently and with less expenses.

V. 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 swing⁴⁰³ and a method of exercising a cat,⁴⁰⁴ 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

⁴⁰³ U.S. Patent No. 6,368,227 (filed Nov. 17, 2000).

⁴⁰⁴ U.S. Patent No. 5,443,036 (filed Nov. 2, 1993).

breakdown.”⁴⁰⁵ 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 § 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 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”,⁴⁰⁶ 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.

⁴⁰⁵ Graf, *supra* note 33, at 496.

⁴⁰⁶ *Jacobellis v. Ohio*, 378 U.S. 184, 197 (1964) (Stewart, P., concurring) (using this phrase to describe the threshold of obscenity).