No. 08-964

IN THE

Supreme Court of the United States

BERNARD L. BILSKI AND RAND A. WARSAW,

Petitioners,

v.

JOHN J. DOLL, ACTING UNDER SECRETARY OF COMMERCE FOR INTELLECTUAL PROPERTY AND ACTING DIRECTOR, PATENT AND TRADEMARK OFFICE,

Respondent.

On Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

BRIEF AMICUS CURIAE OF INTERNATIONAL BUSINESS MACHINES CORPORATION IN SUPPORT OF NEITHER PARTY

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BRIEF AMICUS CURIAE OF INTERNATIONAL BUSINESS MACHINES CORPORATION IN SUPPORT OF NEITHER PARTY

STATEMENT OF INTEREST OF AMICUS CURIAE[1]

[1] Pursuant to Sup. Ct. R. 37.6, amicus notes that no counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than amicus curiae, its members, or its counsel made a monetary contribution to its preparation or submission. Petitioners and Respondents have consented to the filing of this

International Business Machines Corporation (IBM) is a globally recognized leader in the field of information technology research, development, design, manufacturing, and related services. During IBM's nearly 100-year history, its employees have included five Nobel laureates, five National Medal of Science recipients, and seven winners of the National Medal of Technology. The United States Patent and Trademark Office (PTO) has granted IBM tens of thousands of United States patents, including more patents than any other corporate assignee for the past sixteen years. IBM has filed amicus briefs in other cases before the Court involving interpretation of the patent laws. *See*, *e.g.*, *Quanta Computer, Inc.* v. *LG Electronics, Inc.*, 128 S. Ct. 2109 (2008); *KSR Int'l Co.* v. *Teleflex Inc.*, 550 U.S. 398 (2007); *eBay Inc.* v. *MercExchange, LLC*, 547 U.S. 388 (2006).

In light of its sizeable patent portfolio and diverse business interests, IBM can provide a balanced view of the patentability standard under 35 U.S.C. § 101—particularly as it relates to the patenting of software and business method related inventions. As a leading recipient, licensee, and licensor of patents, IBM has a compelling interest in the development of clear and consistent rules governing subject matter patentability and is committed to maintaining the integrity of the United States patent laws—and the quality of patents themselves. IBM has frequently been involved in patent litigation, both as a patentee seeking to enforce its patent rights and as an accused infringer defending itself against others' claims. As a major force in the information technology industry,

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brief through blanket consent letters filed with the Clerk's Office.

IBM has firsthand knowledge of the critical role the patent laws have played over the last few decades in software and information technology research and development.

This case presents the question whether a nontechnological business method is patentable subject matter. But the Federal Circuit's opinion has needlessly created confusion regarding the patentability of software—the computer-readable code embodying functionality in virtually every modern information technology system or device. Software is the means by which we use our computers to do word processing, send email and surf the Web; it enables our cellphones to connect to wireless networks; it allows air traffic controllers to safely schedule the arrival and departure of flights; and it permits physicians to diagnose and treat illnesses. Software is, in short, a fundamental, and increasingly indispensable, technological innovation.

In the months since the Federal Circuit issued its opinion, and to IBM's great concern, a number of administrative and judicial decisions have rigidly applied the "machine or transformation" test to question—in some cases explicitly—the patentability of software per se. Software technology is vital in addressing society's most pressing challenges. IBM is committed to ensuring that such technology is and remains patentable.

INTRODUCTION

Two Terms ago, in *KSR International Co.* v. *Teleflex Inc.*, 550 U.S. 398 (2007), this Court rejected the Federal Circuit's "rigid" test for obviousness under Section 103 of the Patent Act in favor of a

"flexible" and "functional" approach that returned the analysis to the underlying principles of the Court's prior decisions on obviousness. *Id.* at 415, 417. As the Court explained, the Federal Circuit erred in transforming "[h]elpful insights" and "general principle[s]" from this Court's prior case law into a "rigid and mandatory formula[ ]" and a "formalistic conception" for determining obviousness. *Id.* at 419.

This case presents a similar situation, and the Court's guidance again is needed—this time to return the Section 101 patentability inquiry to a flexible, functional approach that values substance over form in assessing patentability. The Court has long and often recognized that " 'the primary purpose of our patent laws is not the creation of private fortunes for the owners of patents but is "to promote the progress of science and the useful arts," ' " *Quanta Computer*, 128 S. Ct. at 2116 (quoting *Motion Picture Patents Co.* v. *Universal Film Mfg. Co.*, 243 U.S. 502, 518 (1917) (quoting U.S. Const., art. I, § 8, cl. 8)).[2] Determining what kinds of inventions the patent laws protect is critical to properly promote innovation and balance the rights of inventors and the public. The Federal Circuit's splintered decision in this case reflects that court's considerable struggle to settle on a "test" to distinguish patentable subject matter from what this Court and the patent community have long agreed are unpatentable fundamental principles, namely:

[2] Article I, § 8, cl. 8 of the U.S. Constitution grants Congress the power "[t]o promote the Progress of Science and the useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries." U.S. Const., art. I, § 8, cl. 8.

laws of nature, natural phenomena, mental processes, and abstract ideas. But the Federal Circuit's narrow view that a single formalistic test determines whether any process constitutes patentable subject matter—a test asking whether a claimed process is tied to a particular machine or transforms a particular article into a different state or thing, Pet. App. 12a—is just the sort of rigid approach this Court rejected in *KSR*.

The proper analysis—as in *KSR*—is one that examines the substance of the invention in view of the purpose of the patent laws. In this case, the substantive approach is to determine if the claimed process provides a technological contribution and thus advances the "useful arts," without preempting the use of laws of nature, natural phenomena, mental processes, or abstract ideas. Such an approach will protect the application of fundamental principles in inventions that serve the constitutional purpose of promoting the useful arts, while avoiding removal of these principles from the "storehouse of knowledge of all men." *Funk Bros. Seed Co.* v. *Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948).

SUMMARY OF ARGUMENT

Section 101 is the gatekeeper of the patent system. It establishes the threshold requirement that claims be drawn to patentable subject matter, which it states are "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." 35 U.S.C. § 101. The constitutional purpose of the patent system and this Court's precedents establish two key limitations on patentability: Inventions which do not involve technological contributions are outside the scope of

patentable subject matter, as are laws of nature, natural phenomena, mental processes, and abstract intellectual ideas. Theoretical or abstract discoveries thus are excluded from patent protection.

The machine-or-transformation test is a useful analytical tool to determine whether a claimed process impermissibly preempts a fundamental principle and is thus unpatentable. But it would be a mistake for courts to rely *only* on the machine-or-transformation test when assessing an invention's patentability, because the test diverts the inquiry from the central question whether the substance of the invention provides a technological contribution and instead focuses on the form of the claim. If applied as the exclusive test for determining the patentability of all processes, the machine-or-transformation test will result (and is already resulting) in both false positives and false negatives—and will be readily circumvented by clever patent drafters. Consistent with the purpose of the patent system, the initial and potentially dispositive inquiry must *always* be whether the claimed process makes a technological contribution to the useful arts.

This case presents the Court an opportunity to clarify the requirements for subject matter patentability. Petitioner Bilski's claims were directed to a nontechnological business method; but the Federal Circuit's machine-or-transformation test has put in play the issue of subject matter patentability of software. In view of the critical importance of software innovation, this Court should confirm that software is a technological field and that software inventions are patentable.

Information technology systems powered by software are pervasive. From the systems that protect our national security,[3] control modern transportation,[4] and help doctors perform precision surgery,[5] to the systems that run our cars,[6] cellphones,[7] and of course our personal computers, our everyday lives are in countless ways enabled and enhanced by information technology systems. And it is the software in these systems that increasingly contains their functionality.

This case thus requires the Court to strike a balance between the technological and nontechnological arts, embracing broad patentability for the former while excluding the latter from patentability. The question on which that balance turns is whether a process provides a technological contribution. Patenting technological inventions

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[3] *See*, *e.g.*, Dep't of Homeland Security, *The National Strategy to Secure Cyberspace* (Feb. 2003), *available at* http://www.dhs.gov/xlibrary/assets/National_Cyberspace_Strategy.pdf.

[4] *See*, *e.g.*, Dep't of Transportation, *U.S. Department of Transportation Announces Computer Software to Improve Transportation Decisions*, (Oct. 2, 2000), *available at* http://www.dot.gov/affairs/fhwa6300.htm; Heinz Erzberger, *Transforming the NAS: The Next Generation Air Traffic Control System, NASA* (2004), *available at* http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20050110294_2005093599.pdf.

[5] *See*, *e.g.*, Isabelle M. Germano, *Advanced Techniques in Image-Guided Brain and Spine Surgery* 49 (2002).

[6] *See*, *e.g.*, M. Broy, *Challenges in Automotive Software Engineering*, International Conference on Software Engineering, Association for Computing Machinery (2006).

[7] *See*, *e.g.*, *Blackberry Operating System Downloads*, *available at* http://www.blackberryfaq.com/index.php/BlackBerry_Operating_System_Downloads.

promotes innovation. No sound patent policy supports protection for non-technological processes, including non-technological business methods.

ARGUMENT

I. THE PROPER INQUIRY FOR PATENTABLE SUBJECT MATTER FOCUSES ON WHETHER THE CLAIMED PROCESS MAKES A TECHNOLOGICAL CONTRIBUTION.

The Constitution does not contemplate unfettered authority to issue patents. *See* U.S. Const. art. I, § 8. Instead, the Constitution provides a "qualified authority * * * limited to the promotion of advances in the 'useful arts.' " *Graham* v. *John Deere Co.*, 383 U.S. 1, 5 (1966); *see also KSR*, 550 U.S. at 427 (reaffirming that patents are designed to promote "the progress of useful arts"). As a result, "[t]he standard of patentability is a constitutional standard[.]" *Great Atlantic & Pac. Tea Co.* v. *Supermarket Equip. Corp.*, 340 U.S. 147, 155 (1950) (Douglas, J., concurring).

Consistent with that constitutional standard, this Court's precedents over two centuries have tethered patentability to technological innovation. As the Court explained in *Pfaff* v. *Wells Electronics, Inc.*, 525 U.S. 55, 63 (1998), "the patent system represents a carefully crafted bargain that encourages both the creation and the public disclosure of new and useful advances *in technology*, in return for an exclusive monopoly for a limited period of time." (Emphasis added.)

In fact, Congress created the Federal Circuit as an exclusive appellate court for patent cases in hopes

that "increased uniformity would 'strengthen the United States patent system in such a way as *to foster technological growth and industrial innovation*.' " *Markman* v. *Westview Instruments, Inc.*, 517 U.S. 370, 390 (1996) (emphasis added and citation omitted); *see also Bonito Boats, Inc.* v. *Thunder Craft Boats, Inc.*, 489 U.S. 141, 150-151 (1989) ("The federal patent system thus embodies a carefully crafted bargain for encouraging the creation and disclosure of new, useful, and nonobvious *advances in technology and design* in return for the exclusive right to practice the invention for a period of years.") (emphasis added); *Diamond* v. *Chakrabarty*, 447 U.S. 303, 316 (1980) ("Mr. Justice Douglas reminded that the inventions most benefiting mankind are those that 'push back the frontiers of chemistry, physics, and the like.' ") (citation omitted); *Great Atlantic & Pacific Tea Co.*, 340 U.S. at 154-155 (Douglas, J., concurring) ("The Framers plainly did not want [patent] monopolies freely granted. *The invention, to justify a patent, had to serve the ends of science—to push back the frontiers of chemistry, physics, and the like; to make a distinctive contribution to scientific knowledge.* * * * Patents serve a higher end—*the advancement of science*.") (emphases added).[8]

Patentability has been—and must continue to be—interpreted with " 'reference to [the] standard written into the Constitution.' " *Graham*, 383 U.S. at

[8] The technological contribution standard is a constitutional one, and all discussion of that standard described in this brief is a synthesis of the requirements for subject matter patentability under U.S. patent law. The standards for subject matter patentability adopted by non-U.S. jurisdictions have no bearing on the constitutional standard that governs here.

6 (citation omitted). Thus, to be patentable, a claim must further the purpose "of advancing the useful arts—the process today called technological innovation." *Paulik* v. *Rizkalla*, 760 F.2d 1270, 1276 (Fed. Cir. 1985) (Newman, J.) (en banc); *see also* Karl B. Lutz, *Patents and Science: A Clarification of the Patent Clause of the U.S. Constitution*, 18 Geo. Wash. L. Rev. 50, 54 (1949) ("The term 'useful arts,' as used in the Constitution * * * is best represented in modern language by the word 'technology.'").[9] The "most fundamental attribute of the useful arts" is that they "relate to controlling the forces and materials of nature and putting them to work in a practical way for utilitarian ends serving mankind's physical welfare." Robert I. Coulter, *The Field of the Statutory Useful Arts, Part II*, 34 J. Patent Office Soc'y 487, 498-499 (1952).

The baseline, then, of this Court's precedent as informed by the constitutional standard of promoting the useful arts is that to be patentable subject matter, a "process" must involve a technological

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[9] *See also*, *e.g.*, *In re Foster*, 438 F.2d 1011, 1014-15 (CCPA 1971) ("All that is necessary * * * to make a sequence of operational steps a statutory 'process' within 35 U.S.C. § 101 is that it be in the technological arts."); *In re Musgrave*, 431 F.2d 882, 893 (CCPA 1970) (patentable processes must "be in the technological arts so as to be in consonance with the Constitutional purpose to promote the progress of 'useful arts.' "); *see also* John R. Thomas, *The Patenting of the Liberal Professions*, 40 B.C. L. Rev. 1139, 1164 (1999) (constitutional stricture of promoting the "useful arts" is in contrast to promoting the "seven 'liberal arts' and the four 'fine arts' of classical learning.").

contribution.[10] And if the process relies on a fundamental principle—a law of nature, abstract idea, natural phenomena or mental process—that process as claimed in the patent must represent a specific application of that principle to avoid preempting all its uses. This Court's precedents over more than a century have identified these fundamental principles as belonging to humankind and not the proper subject of a patent monopoly.

Pre-1952 cases. Long before the 1952 Patent Act introduced the term "process" in setting out patentable subject matter, this Court had made clear that patent protection could extend to processes.[11]

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[10] Contrary to the *Bilski* majority view, the concept of scientific or technological innovation is not an ambiguous one. As Judge Mayer pointed out, "the meaning of those terms is not particularly difficult to grasp." Pet. App. 130a (Mayer, J., dissenting). This is not to say that technology is static. Technology, by its nature, is constantly changing, and tomorrow's technological advances often seem unimaginable today. A rigid test for patentability ignores the fundamental dynamics of technological evolution that the patent laws are designed to protect.

[11] Although the Patent Act did not use the term process until 1952, "a process has historically enjoyed patent protection because it was considered a form of 'art' as that term was used in the 1793 Act." *Diamond* v. *Diehr*, 450 U.S. 175, 182 (1981). "Analysis of the eligibility of a claim of patent protection for a 'process' did not change with the addition of that term to § 101." *Id.* at 184; *see also* S. Rep. No. 82-1979, at 5 (1952) ("Th[e] language [of the predecessor provision to § 101] has been preserved except that the word 'art' which appears in the present statute has been changed to the word 'process."); *Tilghman* v. *Proctor*, 102 U.S. 707, 722 (1881) ("A manufacturing process is clearly an art, within the meaning of the law."); *Cochrane* v. *Deener*, 94 U.S. 780, 787-88 (1877) (process is patentable); *Corning* v. *Burden*, 56 U.S. (15 How.) 252, 267 (1854) (same).

But the Court's early decisions also made clear that not all processes are patentable. In 1854, for example, this Court rejected as unpatentable a process claim broadly covering the concept of transmitting messages using an electromagnetic current. *See O'Reilly* v. *Morse*, 56 U.S. (15 How.) 62, 112-113 (1854). As the Court explained, that claim was unpatentable because it would protect, and thereby preempt, all conceivable solutions to accomplish the recited result. *Id.* at 113. Morse was entitled to a patent only for the specific method of transmitting messages by way of an electromagnetic current that he actually invented—*i.e.*, his technological contribution to the useful arts. *Id.* at 117. Because it properly focused on the substance of Morse's invention and its technological character, the Court was able to distinguish between those claims that were patentable and those that were unpatentable. *See also Rubber-Tip Pencil Co.* v. *Howard*, 87 U.S. (20 Wall.) 498, 507 (1874) ("An idea of itself is not patentable, but a new device by which it may be made practically useful is."); *Le Roy* v. *Tatham*, 55 U.S. (14 How.) 156, 175 (1853) ("A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot he patented, as no one can claim in either of them an exclusive right.").[12]

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[12] The circuit courts routinely applied this first rule of patentability in holding method claims unpatentable where they make no technological contribution or preempt a fundamental principle. *See*, *e.g.*, *Joseph E. Seagram & Sons, Inc.* v. *Marzall*, 180 F.2d 26, 27-28 (D.C. Cir. 1950); *Loew's Drive-in Theatres*, *Inc.* v. *Park-In Theatres*, *Inc.*, 174 F.2d 547, 553 (1st Cir. 1949); *Hotel Sec. Checking Co.* v. *Lorraine Co.*, 160 F. 467, 469-472 (2d Cir. 1908).

Post-1952 cases. As part of a general revision to the patent laws in 1952, Congress substituted the term "process" for the term "art" in setting out patentable subject matter. Cases following the 1952 amendment reinforce that patentable "processes" require a technological innovation. In *Gottschalk* v. *Benson*, 409 U.S. 63 (1972), the Court held unpatentable a claimed "method for converting binary-coded decimal (BCD) numerals into pure binary numerals." *Id.* at 64. The claimed process was unpatentable because it was not "limited to any particular art or technology, to any particular apparatus or machinery, or to any particular end use," but rather "purported to cover any use of the claimed method in a general-purpose digital computer of any type." *Id.* The claimed method did not constitute a practical application of any fundamental principle and was thus ineligible for patent protection. In ruling, the Court explained that although "[i]t is argued that a process patent must either be tied to a particular machine or apparatus or must operate to change articles or materials to a 'different state or thing,' " the Court declined to "hold that no process could ever qualify if it did not meet the requirements of our prior precedents." *Id.* at 71.

A few years later, in *Parker* v. *Flook*, 437 U.S. 584, 594-596 (1978), the Court held unpatentable a claimed method for computing an "alarm limit" in the conversion of hydrocarbons. This claimed process was unpatentable because it simply provided a formula for computing an alarm limit, without specifying or disclosing any relevant variables or processes at work. *Id.* at 586. As the Court explained, an application of a mathematical formula,

principle, or phenomenon of nature may be patented only if "there is some other inventive concept in its application." *Id.* at 594. *Accord Mackay Radio & Tel. Co.* v. *Radio Corp. of Am.*, 306 U.S. 86, 94 (1939) ("While a scientific truth, or the mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of the knowledge of scientific truth may be.").

Finally, in *Diehr*, 450 U.S. 175, the Court held patentable a "process for molding raw, uncured synthetic rubber into cured precision products" because the "claims were not directed to a mathematical algorithm or an improved method of calculation but rather recited an improved process for molding rubber articles by solving a practical problem which had risen in the molding of rubber products." *Id.* at 177, 181. As the Court explained, "when a claim containing a mathematical formula implements or applies that formula in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect (*e.g.*, transforming or reducing an article to a different state or thing), then the claim satisfies the requirements of § 101." *Id.* at 192.

All of these cases reiterate that an inventor may rely on or apply a fundamental principle to achieve a specific technological innovation—but an inventor may not claim a process that would preempt all uses of that fundamental principle in subsequent technological advances.[13] "Phenomena of nature,

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[13] *See* Andrew A. Schwartz, *The Patent Office Meets the Poison Pill: Why Legal Methods Cannot be Patented*, 20 Harv. J. Law & Tech. 333, 357 (2007) (The "clear and consistent body of Supreme Court case law establishes that the term 'invention'

though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work." *Benson*, 409 U.S. at 67; *accord Chakrabarty*, 447 U.S. at 309 ("The laws of nature, physical phenomena, and abstract ideas have been held not patentable.").

This Court has observed that it is not always easy to draw the line between patentable and unpatentable subject matter. *See Flook*, 437 U.S. at 589 ("The line between a patentable 'process' and an unpatentable 'principle' is not always clear"); *Lab. Corp. of Am. Holdings* v. *Metabolite Labs., Inc.*, 548 U.S. 124, 134 (2006) (Breyer, J., dissenting from dismissal of writ of certiorari) ("[T]he category of non-patentable 'phenomena of nature,' like the categories of 'mental processes,' and 'abstract intellectual concepts,' is not easy to define.").[14] But one unifying principle is evident: an invention must provide a technological contribution to satisfy the requirement of patentable subject matter.

This inquiry can not be addressed by a rigid formula; it must be flexible to accommodate the changing nature of innovation. Innovations that are

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encompasses anything made by man that utilizes or harnesses one or more 'laws of nature' for human benefit.").

[14] The Court has exercised great care in addressing new fields of technology—to ensure that early patents do not improperly claim a fundamental principle and thereby discourage subsequent development. *See*, *e.g.*, *Flook* at 596 ("It is our duty to construe the patent statutes as they now read, in light of our prior precedents, and we must proceed cautiously when we are asked to extend patent rights into areas wholly unforeseen by Congress.").

clearly nontechnological—such as Bilski's claims to a method of hedging commodity risk—are not patentable subject matter. On the other hand, clearly technological innovations, such as the software that operates a magnetic resonance imaging (MRI) machine[15] or a word processor, are patentable subject matter.

II. THE MACHINE-OR-TRANSFORMATION TEST IS A USEFUL, BUT NOT UNIVERSALLY DISPOSITIVE, AID TO DETERMINING PATENTABILITY.

The Federal Circuit concluded that its machine-or-transformation test would "surely" determine whether a claimed process is patent-eligible under Section 101. Pet. App. 12a. While the machine-or-transformation test may, in some circumstances, be a useful analytic tool to determine whether a claimed process in fact includes a technological contribution that does not preempt a fundamental principle, it is far short of a "sure[ ]" one-size-fits-all litmus test for subject matter patentability. Enshrining this test as the sole means of determining patent eligibility would be detrimental to innovations the patent system was intended to promote. By focusing the inquiry on whether a process is tied to a particular machine or transforms a particular article to a different state or thing, the machine-or-transformation test focuses unduly on the *form* of the claimed process, which in many cases distracts from properly evaluating the *substance* of the invention for

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[15] *See*, *e.g.*, Robson Macedo & David Bluemke, *New MRI Software: Nifty Spins*, Imaging Economics (Feb. 2006), *available at* http://www.imagingeconomics.com/issues/articles/2006-02_02.asp.

whether it makes a (patentable) technological contribution.

Consider, for example, the patent claim at issue in this case. If Bilski had merely added that the "risk hedging" method is performed on a computer, this would not appear to change the nature of the invention; the method remains unpatentable subject matter because it makes no technological contribution. The machine-or-transformation test, however, directs the focus to the arbitrarily added computer, diverting attention away from what should be the substantive inquiry into whether the inventive process provides a technological contribution. *See also Diehr*, 450 U.S. at 192 (warning against "allow[ing] a competent draftsman to evade the recognized limitations on the type of subject matter eligible for patent protection").

The Section 101 inquiry therefore should remain focused on the overall purpose of the patent system: to protect technological advances. *See General Elec. Co.* v. *Jewel Incandescent Lamp Co.*, 326 U.S. 242, 249 (1945) (invention is unpatentable if it "d[oes] not advance the frontiers of science in this narrow field so as to satisfy the exacting standards of our patent system"). The initial inquiry for patentability should be whether the claimed process signifies a useful technological advance, with the machine-or-transformation test as a subordinate inquiry in appropriate instances. Using the machine-or-transformation test as anything more than a useful analytic tool to assist in evaluating whether a non-preemptive technological innovation is present will "risk[ ] hobbling" advances like software technology and imperil "patent protection for tomorrow's

technologies." Pet. App. 143a (Rader, J., dissenting). As this Court stated in *KSR*, application of the patent laws "must not be confined within a test or formulation too constrained to serve its purpose." 550 U.S. at 427.

III. SOFTWARE INVENTIONS THAT MAKE TECHNOLOGICAL CONTRIBUTIONS ARE PATENTABLE.

The invention before the Court is directed to a method of hedging commodity risk, a nontechnological business method. But the Federal Circuit's opinion addresses much more: "what test or set of criteria governs the determination * * * as to whether a claim to a process is patentable under § 101 or, conversely, is drawn to unpatentable subject matter because it claims only a fundamental principle." Pet. App. 8a. And when that court assessed Bilski's claims and found them wanting, it drew on its own precedents in a variety of fields—including information technology. *See* Pet. App. 22a (citing, among others, *In re Abele*, 684 F.2d 902, 903 (CCPA 1982) (invention in the field of image processing "particularly as applied to computerized axial tomography or CAT scans"). It accordingly is not particularly surprising that in subsequent proceedings before the Board of Patent Appeals and Interferences (the "Board") and in the federal district courts, the machine-or-transformation test has been automatically applied to information technology inventions—with a particular critical focus on software. *See*, *e.g.*, *Ex Parte Petculescu*, No. 2008-2859, 2009 WL 1718896, at * 7 (BPAI June 4, 2009) (rejecting software per se claims on the basis that "[b]ecause the software does not transform a tangible

article, the claims do not recite statutory subject matter" and the claims "fail the machine-or-transformation test, and are not patent-eligible process claims"); *Ex parte Mazzara*, No. 2008-4741, 2009 WL 291178, at *12 n.3 (BPAI Feb. 5, 2009) ("No portion of this decision should be interpreted as holding that claims to computer software, *per se*, are deemed to be directed to patentable subject matter under 35 U.S.C. § 101.").

The Federal Circuit's test has thus precipitated confusion, as the Board and the courts struggle to determine the subject matter patentability of software in cases that heretofore would have been properly and easily recognizable as technological (and thus presumptively patentable subject matter). This sudden and unjustified removal of clearly technological inventions from patentability cannot be tolerated.

Software is the means through which innovation is expressed in the Information Age; it is "the new physical infrastructure of the information age." *Report to the President, "Information Technology Research: Investing in Our Future,"* President's Information Tech. Advisory Comm. (PITAC), Nat'l Coordination Office for Computing, Info. & Commc'ns (1999).[16] We rely daily on software

[16] Not only does software perform the functions once the province of electrical and mechanical systems, but the field of software technology has created *new* vistas of technological innovation that have no analog in their predecessor technologies. For example, a software-controlled electronic fuel injection system has replaced, and now performs more efficiently the function of, carburetors in our vehicles. And software that performs data mining, *see*, *e.g.*, U.S. Patent No.

embedded in everything from computers to automobiles to cell phones to security and medical equipment for our continued health, safety, employment, communication, and social interaction. And it is through software that we are able to take on the major challenges confronting our modern networked world—including those presented by climate change, supply chains for food and medicine, security concerns ranging from identity theft to terrorism, and the management of financial systems.

A few examples are illustrative. To combat the wide range of security threats confronting their constituents, governments are implementing advanced security systems based on sophisticated software to perform tasks such as license plate recognition, trending analysis, and intelligent searching. These systems allow officials to monitor from a central system everything from daily traffic patterns to suspicious activities and broader public safety concerns.[17]

Air traffic control systems also employ sophisticated software to process information received from multiple inbound and outbound aircraft including location, altitude, and speed; to

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6,094,651 "Discovery-driven exploration of OLAP data cubes," is a new technological innovation with no hardware analog.

[17] *See*, *e.g.*, W. David Gardner, *Chicago Taps IBM, Firetide to Install "Operation Virtual Shield*," InformationWeek (Sept. 27, 2007), *available at* http://www.informationweek.com/news/mobility/security/showArticle.jhtml?articleID=202102357; Jim McKay, *Police Tout License Plate Recognition Systems as the Next Big Thing Government Technology* (May 12, 2008), *available at* http://www.govtech.com/gt/273037.

monitor weather patterns; and to feed this data to advanced collision avoidance software systems.[18]

Software also enables more efficient resource usage. We typically extract only 1/3 of the oil in an existing reserve using current technology. Software imaging techniques enable real-time 3-D models of oil reservoirs, reducing guesswork and increasing output.[19]

Consider, too, software contributing to our Nation's financial security. Under the Patriot Act, financial institutions are required to assess the risk that their customers may be laundering money. Sophisticated software systems allow financial institutions to collect and analyze millions of pages of data from the web and other sources to spot complex patterns indicative of potential money-laundering activities that could not previously be detected.[20]

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[18] *See* U.S. Centennial of Flight Commission, *Air Traffic Control*, *available at* http://www.centennialofflight.gov/essay/Government_Role/Air_traffic_control/POL15.htm.

[19] *See*, *e.g.*, Denise Brehm, MIT, Dep't of Civil & Envtl. Eng'g, *CEE Mapping Technology could make oil extraction more efficient* (Jan. 16, 2009), *available at* http://cee.mit.edu/news/releases/2009/oilrecovery; *see also* Dep't of Energy, *Diagnostics, Imaging, and Fundamental R&D: Advanced Diagnostics & Imaging Research, Oil & Natural Gas Supply & Delivery*, *available at* http://fossil.energy.gov/programs/oilgas/fundamental/index.html.

[20] *See*, *e.g.*, *IBM and Semagix Join Forces to Combat Money Laundering* (Feb. 4, 2004), *available at* http://domino.watson.ibm.com/comm/pr.nsf/pages/news.20040204_money.html; *see also* Corp. for Am. Banking, *Anti-Money Laundering (AML) Transaction Monitoring Software*, *available at* http://www.aba.com/CAB/cab_fortent.htm.

In view of the significant technological nature of these inventions and the critical global challenges they address, IBM finds alarming decisions in the wake of *Bilski* concluding that software is excluded from patentable subject matter. In many instances these decisions explicitly acknowledge that the identical function deemed unpatentable in software would have been patentable if limited to embodiment in hardware, and that the mere inclusion of a software element in a claim would render the claim unpatentable. *See*, *e.g.*, *Ex Parte Altman*, No. 2008-2386, 2009 WL 1709111, at *5 (BPAI May 29, 2009) ("[W]e conclude that the scope of the claimed 'system' broadly encompasses both statutory (hardware based) and non statutory (disembodied software or computer program per se) embodiments. * * * 'If a claim covers material not found in any of the four statutory categories, that claim falls outside the plainly expressed scope of § 101 even if the subject matter is otherwise new and useful.' ") (citations omitted); *Ex Parte Godwin*, No. 2008-0130, 2008 WL 4898213, at *2 (BPAI Nov. 13, 2008) (claim unpatentable where specification "clearly indicates that Appellants' invention is not limited solely to hardware embodiments" and can "be realized in hardware, software, or a combination of hardware and software").

Such distinction is the height of a form-over-substance analysis; after all, the Board clearly recognizes the patentability of the claimed function, and finds that function to be unpatentable subject matter only because the function is or may be

realized in software.[21] Far more troubling is what this faulty analysis portends for software innovators. Many software inventions are only commercially practicable in software or have no hardware analog. This leaves software innovators with a Hobson's choice: patent their inventions in hardware—enabling competitors to learn these innovative functions and implement them in software immune from claims of patent infringement—or completely forgo patent protection for software innovations and maintain their secrecy if possible.

A. Courts Have Recognized That Software Is Patentable Subject Matter.

The courts have guided the software industry in its reliance on patent protection. In the early days of software innovation, copyright was the preferred form of intellectual property protection. *See* Ronald J. Mann, *Do Patents Facilitate Financing in the Software Industry?*, 83 Tex. L. Rev. 961, 971-972 (2005). A series of decisions in the early 1990s culminating in the First Circuit's decision in *Lotus Development Corp.* v. *Borland International, Inc.*, successively diminished the protection provided by copyright to software, recognizing that it was inappropriate for copyright law to protect the functional aspects of software. 49 F.3d 807 (1st Cir. 1995), *aff'd per curiam by an equally divided Court*, 516 U.S. 233 (1996). In *Lotus*, the First Circuit held that the menu command hierarchy of a computer spreadsheet program was "uncopyrightable" as user

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[21] By way of analogy, imagine the patent office fifty years ago declining to patent an innovative pump system merely because it was claimed as an electrically actuated pump rather than a manually activated pump.

interface software that functions as a method of operating a computer program. *See* 49 F.3d at 819 (Boudin, J., concurring) ("The computer program is a means for causing something to happen; it has a mechanical utility, an instrumental role, in accomplishing the world's work."); *see also* Computer Science & Telecomm. Bd., Nat'l Research Council, *Intellectual Property Issues in Software* 24 (1991) ("Copyright protection is extended only to expression of ideas, not to the underlying ideas themselves."); 17 U.S.C. 102(b) ("In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work."). While copyright law accordingly provides important protections against copying the expression embodied in software, the functional innovations that software provides are not effectively protected by copyright law.

By limiting copyright protection for software, the courts have appropriately guided software innovators to seek patent protection. Josh Lerner & Feng Zhu, *What is the Impact of Sofware Patent Shifts?: Evidence from* Lotus v. Borland, Harvard Univ. & Nat'l Bur. of Econ. Research, 25 Int'l J. of Ind. Org. 511 (2007); Mann, *supra*, 83 Tex. L. Rev. at 971-972 (2005). This judicial direction has resulted in substantial economic, technological, and societal benefit because software patents promote innovation both within and beyond the field of software.[22]

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[22] Without the benefit of patent protection, software companies would be forced to rely on secrecy which limits the public's ability to learn from software innovations, since patent documents are a significant source of technological disclosure.

B. Software Patent Protection Provides Significant Economic, Technological, and Societal Benefits.

The software industry is one of the most vibrant sectors of our economy. The software and information industries together generated $564.1 billion in revenue in 2005. Software & Info. Indus. Ass'n, *Software and Information Driving the Global Knowledge Economy* 27 (2008). These industries grew 10.8 percent in 2005, more than three times the overall U.S. Gross Domestic Product's growth of 3.2 percent that year. *Id.* at 7. The industries also represented 13 percent of total overseas sales of all U.S. industries in 2004 and grew direct export sales by more than 30 percent from 2000 to 2006. *Id.* at 9. Software and information technology is the fourth largest industry in the United States—ahead of food manufacturing and telecommunications. *Id.* at 8.

The software and information technology industries are also a significant force in the United States labor market. In 2006, the industries employed more than 2.7 million Americans, adding more than 400,000 jobs between 1997 and 2006. *Id.* These gains contrasted sharply with declines in other industries, including telecommunications (-8%), transportation equipment manufacturing

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See, *e.g.*, *In re Alappat*, 33 F.3d 1526, 1571 (Fed. Cir. 1994) (Newman, J., concurring). Given the reality that software source code is human readable, and object code can be reverse engineered, it is difficult for software developers to resort to secrecy. Thus, without patent protection, the incentives to innovate in the field of software are significantly reduced. Patent protection has promoted the free sharing of source code on a patentee's terms—which has fueled the explosive growth of open source software development.

(-13%), and chemical manufacturing (-13%). *Id.* Additionally, the U.S. Department of Labor has projected the labor market in the software industry will continue to be among the fastest growing from 2006 to 2016. Dep't of Labor, *Occupational Outlook Handbook* 9 (2008). And it projects that computer software engineers will enjoy the largest job growth for candidates with bachelor's degrees during that time, with doctoral degree recipients in the field of computer research and information science projected to enjoy the second-fastest growth in job opportunities. *Id.* Protecting software patents is essential to the continued expansion of this labor market.

The benefits of software innovation also extend to other industries. Software is an enabling technology, and software innovations are not confined to software companies. They help drive innovations in many sectors of the American economy, including industries such as transportation, security, energy, and in biotechnology research. *Supra* at 7; *see also* Pet. App. 143a (Rader, J., dissenting) ("Innovation has moved beyond the brick and mortar world. * * * Today's software transforms our lives without physical anchors.").

The economic benefits that flow from software innovation are the product of significant investment in research and development. And the incentives provided by the patent system encourage that investment by providing the same quid pro quo as in other technology fields: the promise of economic rewards in exchange for the public disclosure of useful inventions. *See generally* Testimony of Nicholas M. Donofrio, Executive Vice President,

Innovation and Technology, IBM Corp., Before the H.R. Comm. on Science (July 21, 2005); Cong. Office of Tech. Assessment, *Finding a Balance: Computer Software, Intellectual Property, and the Challenge of Technological Change*, 23 (1992) (recognizing that "patent protection is of importance to the U.S. software industry"). The exclusive rights granted to patentees encourage software innovators to pursue inventions that they might not otherwise pursue, in broad and diverse areas. *See generally* Mann, *supra*, 83 Tex. L. Rev. 961; John R. Allison, *et al.*, *Frontiers of Intellectual Property: Software Patents, Incumbents, and Entry*, 85 Tex. L. Rev. 1579 (2007).

Patent protection for software protects innovators from appropriation of their efforts by "free-riders." Without patent protection, the risk of appropriation may force software innovators into other, more promising ventures. *See*, *e.g.*, Richard S. Gruner, *Better Living Through Software: Promoting Information Processing Advances Through Patent Incentives*, 74 St. John's L. Rev. 977, 1004 (2000). The free-rider problem is particularly acute in the software sector because software products are "vulnerable to rapid, inexpensive copying that undercuts the initial developer's opportunity to benefit * * *, thereby undermining its incentives to invest in software development." Pamela Samuelson, *et al.*, *A Manifesto Concerning the Legal Protections of Computer Programs*, 94 Colum. L. Rev. 2308, 2332 (1994). While literal copying is the province of copyright law, the ease of appropriating software source code makes the patented inventions included in the code uniquely susceptible to instant appropriation.

As software has grown in importance, investment in software research and development now rivals the investment in hardware research and development. This investment has been steadfast, even during the recent economic downturn. *See* Justin Scheck & Paul Glader, *R&D Spending Holds Steady in Slump*, Wall St. J., A-1 (Apr. 6, 2009). Moreover, the software industry currently commits more than 13% of its sales revenue to research and development—a figure that is greater than or comparable to other research-intensive industries. *Id.*; *see also Corporate R&D Scorecard*, Tech. Rev. 56-57 (Sept. 2005). As Judge Mayer noted below, patents are of "undeniable importance in promoting technological advances," especially advances that require resources and effort to develop. Pet. App. 122a (Mayer, J., dissenting).

The disclosure required to obtain a patent ensures that "the knowledge of the invention enures to the people" and "stimulate[s] ideas and the eventual development of further significant advances in the art." *Kewanee Oil Co.* v. *Bicron Corp.*, 416 U.S. 470, 481 (1974). There is no question that the public disclosure required to obtain a patent advances knowledge, particularly in the fast-paced world of software development, by eliminating the need to replicate a past discovery and permitting others to build on each discovery as it occurs. Patents play a powerful role in the cumulative improvement of inventions. *See* Report of the President's Commission on the Patent System, *To Promote the Progress of * * * Useful Arts in an Age of Exploding Technology* (1966) (explaining that the "patent system encourages early public disclosure of technological information," and that early disclosure "reduces the likelihood of duplication of effort by

others and provides a basis for further advances in the technology involved"); *see also KSR*, 550 U.S. at 427 ("These advances, once part of our shared knowledge, define a new threshold from which innovation starts once more."). Disclosure ensures that, among other things, university computer science students who will be the developers of the next generation of software advancements can study the inventions that power our existing software systems—which would not happen if the inventions were kept secret. In addition, disclosure of software inventions promotes collaboration among software developers (such as open source development) and interoperability among software platforms (such as software interoperability standards).[23]

There is no dispute that software is the infrastructure of today's information age; it performs the same function as hardware did a generation ago and enables new functions beyond those hardware can embody. Sound patent policy compels the conclusion that software is patentable subject matter.

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[23] Software interoperability standards such as those promulgated by the World Wide Web Consortium (w3c) and the Internet Engineering Task Force (IETF) are necessary to enable the important uses of software, *supra* at 18-23, which require acquisition and assimilation of data from numerous heterogeneous sources. With the advent of patent protection for software, firms are able to selectively license innovations on favorable terms to the community of standards users, thus encouraging other firms to participate in and adopt standards.

IV. NON-TECHNOLOGICAL METHODS SHOULD NOT BE PATENTABLE.

Sound patent policy and this Court's precedents support the patentability of technological software innovations. But no sound precedent or policy supports extending patent protection to non-technological inventions, including non-technological processes.

This Court has expressed concern about the patenting of nontechnological methods. *See eBay Inc.*, 547 U.S. at 396-397 (Kennedy, J., concurring); *Lab. Corp.*, 548 U.S. at 135-137 (Breyer, J., dissenting from dismissal of writ of certiorari). These pragmatic concerns are well-placed; they are born of the recognition that non-technological processes are by their nature focused on the ends achieved, not the technological means for achieving those ends. As a result, nontechnological method patents preempt any technological means to achieve the claimed results.

Nor is there any evidence that patent-based incentives are needed to spur innovation, or fund research and development, particularly for nontechnological business methods. "Nowhere in the substantial literature on innovation is there a statement that the United States economy suffers from a lack of innovation in methods of doing business." Leo J. Raskind, *The State Street Bank Decision: The Bad Business of Unlimited Patent Protection for Methods of Doing Business*, 10 Fordham Intel. Prop., Media & Ent. L.J. 61, 92 (1999). As President Coolidge quipped decades ago, "the chief business of the American people is

business." Claude M. Fuess, *Calvin Coolidge, The Man from Vermont* 358 (1940).

In addition, to the extent businesses need protection for certain aspects of their work that have not traditionally enjoyed patent protection, other federal and state legal regimes such as unfair competition law and trade secret law can and have provided that protection. These legal regimes have long policed free-riding and allowed business pioneers to reap the rewards of their ideas. *See* Raskind, *State Street*, 10 Fordham Intell. Prop., Media & Ent. L.J. at 92-93 (noting the "substantial anecdotal evidence that competition alone serves as a sufficient spur to innovation in business methods."). Patent protection is simply not needed to protect non-technological business methods from a market failure problem or fill a legal void or to enhance social welfare.

For all of these reasons, non-technological business methods (like any other nontechnological innovation) should not be patentable subject matter. In most cases, it is simple to discern whether a claim is directed to a technological innovation or a non-technological innovation such as an abstract business method. For inventions that defy ready classification as technological or nontechnological processes, the machine-or-transformation test provides useful guidance for differentiating results-oriented claims that will preempt a whole class of technological applications or embodiments from those that will not.

Correctly differentiating between these two classes is important: Issuing patents on non-technological business methods raises significant competitive

concerns and diminishes the general social welfare. *See*, *e.g.*, Malla Pollack, *Multiple Unconstitutionality of Business Method Patents: Common Sense, Congressional Consideration, and Constitutional History*, 28 Rutgers Computer & Tech. L.J. 76 (2002) ("If we grant rights to exclude unnecessarily, we raise prices and limit competition with no quid pro quo."). Broadly claimed abstract methods restrain the ability of competitors to develop alternatives to the patented invention, thus thwarting a principal aspiration of the patent system, which is to foster new alternatives. *Slimfold Mfg. Co.* v. *Kinkead Indus., Inc.*, 932 F.2d 1453, 1457 (Fed. Cir. 1991) ("Designing around patents is, in fact, one of the ways in which the patent system works to the advantage of the public in promoting progress in the useful arts, its constitutional purpose.").[24]

The absence of a compelling policy rationale for patents on nontechnological processes, including the anticompetitive consequences of issuing these

[24] Consider, for example, the now-ubiquitous automated teller machine ("ATM"). Numerous patents cover mechanical, electrical, and computer-implemented ATM inventions like card readers, touch screens, cash dispensers, statement printers, and antitheft mechanisms. The robust competition within the ATM industry exemplifies that these patents have encouraged industry participants to innovate and allowed their competitors to market alternative designs. Were abstract business methods patentable, an inventor's claim to a "process of performing teller-free transactions" could be considered eligible for patenting under Section 101 and thereby stymied the technological advances in ATM capability and functionality over the years. Much like claim 8 of Samuel Morse's telegraphy patent, *see Morse*, 56 U.S. at 113, such an abstract patent, untethered to a particular practical application, would discourage all others from designing alternative mechanisms for meeting the same marketplace needs.

patents, counsels that this Court clarify that patentable subject matter is limited to inventions involving technological contributions. *See eBay Inc.*, 547 U.S. at 397 (Kennedy, J., concurring) (recognizing the "potential vagueness and suspect validity" of many business method patents). The patent system is designed to serve a specific constitutional purpose: advancing the "useful arts." But granting monopolies on nontechnological inventions such as abstract ways of thinking about business or human interactions has nothing to do with advancing the useful arts—and in fact leads to market inefficiencies and harms the public welfare.

Non-technological patents have eroded public confidence in our patent system, diminished its public benefit, and imposed significant burdens on businesses that have dubious claims asserted against them. For example, patents on non-technological processes like developing legal strategies should be outside the ambit of patentable subject matter. *See* Stephanie L. Valera, *Damned if You Do, Doomed if You Don't: Patenting Legal Methods and Its Affect on Lawyers' Professional Responsibilities*, 60 Fla. L. Rev. 1145, 1146 (2008) ("Imagine, before advising each client, having to confer with the U.S. Patent and Trademark Office (USPTO) to determine whether another lawyer already owns a patent to the legal strategy you wish to propose. Imagine having to pay someone so your client can follow legal advice you wish to impart."); U.S. Patent No. 6,607,389, Systems and Methods for Making Jury Selection Determinations (issued Aug. 19, 2003).[25]

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[25] To be clear, it is not the field of the invention that determines patentability—which would be another improper

At its core, the patent system serves a constitutional purpose of promoting technological advances. The proper definition of patentable subject matter therefore cannot and should not subject the public to rent-seeking on nontechnological innovations.

The innovative aspect of Bilski's claims has nothing to do with technological advancement; it is about the abstract intellectual concept of hedging risk. But the "[t]he patent system is intended to protect and promote advances in science and technology, not ideas about how to structure commercial transactions." Pet. App. 106a (Mayer, J., dissenting).

The constitutional purpose of advancing the technological arts would not be served by finding Bilski's process patentable. *See Great Atlantic & Pacific Tea Co.*, 340 U.S. at 156 ("The question of invention goes back to the constitutional standard in every case.") (Douglas, J., concurring). The Court's concern with avoiding the preemption of scientific principles is designed to ensure that patents issue only for innovations that use or apply those scientific principles and make a technological contribution to the advancement of the useful arts. Bilski's claim makes no technological contribution of any kind and would effectively grant a monopoly on use of the abstract intellectual concept of hedging. Pet. App.

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form-over-substance analysis—but rather, the nature of the invention irrespective of field. It is possible to have technological inventions even in fields not generally associated with technology; likewise, it is possible to see nontechnological innovations in fields generally closely associated with technology.

134a (Rader, J., dissenting); Pet. App. 106a (Mayer, J., dissenting).

Throughout our history, the constitutional and statutory standard for patent-eligible subject matter has been sufficiently flexible to adapt to new technological innovations—ranging from improved methods of manufacturing flour, *Cochrane*, 94 U.S. at 781, 791, to man-made micro-organisms, *Chakrabarty*, 447 U.S. at 318, to a chemical process involving a programmed digital computer, *Diehr*, 450 U.S. at 191-193. Each of these flexible applications of the appropriate scope of patentable subject matter has sought to further technological advances by permitting the application of fundamental principles to new and useful ends while ensuring that these fundamental principles themselves remain available to all. *See United States* v. *Dubilier Condenser Corp.*, 289 U.S. 178, 188 (1933) ("the act of invention * * * consists neither in finding out the laws of nature, nor in fruitful research as to the operation of natural laws, but in discovering how those laws may be utilized or applied for some beneficial purpose, by a process, a device or a machine").

The trilogy of *Benson*, *Flook*, and *Diehr* made clear that a process, to be eligible for patenting, must be more than an abstract idea or concept—even a very useful abstract idea or concept. Bilski's claimed method amounts to a claim on the intellectual concept of hedging and was properly denied. But when it announced a one-size-fits-all test for patentability in the process of deciding Bilski's case, the Federal Circuit precipitated confusion over its applicability to software patentability. Software is and must remain patentable subject matter.

CONCLUSION

Patentable subject matter under Section 101 is restricted to inventions that involve a technological contribution and do not preempt a fundamental principle. Returning the focus to these substantive principles of patentability is necessary to restore balance to the patent system's policy objective of fostering innovation without improperly impacting competition.

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