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The Elusive “Marketplace” in Post-*Bilski* Jurisprudence

ANDREW CHIN*

INTRODUCTION

The Supreme Court’s 2010 decision in *Bilski v. Kappos*¹ appears to have provided inadequate guidance to the courts and the Patent Office regarding the scope of the abstract-ideas exclusion from patentable subject matter. Federal Circuit Chief Judge Randall R. Rader, however, appears to have found in that decision a clear vindication of his own view that the machine-or-transformation test is incorrectly grounded in “the age of iron and steel at a time of subatomic particles and terabytes,”² and thus fails, for example, to accommodate advances in “software [that] transform[] our lives without physical anchors.”³ Chief Judge Rader has subsequently authored a series of opinions identifying the “marketplace” as an operational context in which a claimed invention is not likely to be unpatentably abstract.⁴ This Article argues that this reliance on the “marketplace” is untenable and should form no part of patent-eligibility doctrine.

I. PROLOGUE: *BILSKI*

Bilski was an easy case that made bad—or at least unclear—law. In 1997, Bernard Bilski and Rand Warsaw (Bilski) applied for a patent on a method for making a market for the sale of a commodity, such as natural gas, in which buyers and sellers desired to manage risks relating to fluctuations in the quantity consumed.⁵ Prior art energy trading methods focused

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

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

3. *Id.* at 1015.

4. *See infra* Part II.

5. *See* U.S. Patent Application Serial No. 08/833,892 (filed Apr. 10, 1997). Claim 1 read:

A method for managing the consumption risk costs of a commodity sold by a commodity provider at a fixed price comprising the steps of: (a) initiating a series of transactions between said commodity provider and consumers of said commod-

on managing risks relating to price volatility.⁶ Despite the apparent commercial value of Bilski's method,⁷ Bilski's patent claims met with stiff opposition. Of the twenty-six Supreme Court, Federal Circuit and administrative patent judges who considered Bilski's application, all but one found the claims to be directed to nonstatutory subject matter under 35 U.S.C. § 101.⁸ The judges divided more sharply, however, in their reasoning. Majorities of the Federal Circuit and the Board of Patent Appeals and Interferences held that a patentable process must either be tied to a particular machine or transform an article,⁹ and found Bilski's claims to fail both prongs of this "machine-or-transformation" test.¹⁰ Four Supreme Court justices (including Justice Stevens) and three Federal Circuit judges opined that methods of doing business should be held nonstatutory¹¹—at least those that do not involve manufactures, machines or compositions of matter.¹²

A five-justice Supreme Court majority, however, held that neither a mandatory "machine-or-transformation" test nor the so-called "business

ity wherein said consumers purchase said commodity at a fixed rate based upon historical averages, said fixed rate corresponding to a risk position of said consumer; (b) identifying market participants for said commodity having a counter-risk position to said consumers; and (c) initiating a series of transactions between said commodity provider and said market participants at a second fixed rate such that said series of market participant transactions balances the risk position of said series of consumer transactions.

Id.

6. *See id.*

7. *See Validity of Software Patents Goes on Trial Today at Supreme Court*, USA TODAY, Nov. 9, 2009, at 7B (reporting that Bilski's company, Weatherwise USA, offers energy-billing services that can "lock in energy prices, even during an unusually cold winter").

8. *See In re Bilski*, 545 F.3d at 997 (Newman, J., dissenting) (finding Bilski's claimed process to be "neither a fundamental truth nor an abstraction").

9. *See id.* at 954 (majority opinion) (citations omitted) ("A claimed process is surely patent-eligible under § 101 if: (1) it is tied to a particular machine or apparatus; or (2) it transforms a particular article into a different state or thing."); *Ex parte Bilski*, 2006 WL 5738364, at *18 (holding that a claim that does not recite a specific apparatus may be directed to patentable subject matter "if there is a transformation of physical subject matter from one state into another . . ."); *see also id.* at *14 ("It is possible that a non-machine-implemented method may be nonstatutory subject matter if it does not perform a transformation of physical subject matter even though it contains physical steps that might prevent i[t] from being labeled an 'abstract idea.'").

10. *See In re Bilski*, 545 F.3d at 962 (finding "the machine implementation part of the test" inapplicable to Bilski's claims); *id.* at 963 (holding that Bilski's claims do not transform any article to a different state or thing); *Ex parte Bilski*, 2006 WL 5738364, at *2 (noting that Bilski's claims are "non-machine-implemented"); *id.* at *18–20 (holding that none of Bilski's claims involve a physical transformation).

11. *See Bilski v. Kappos*, 130 S. Ct. 3218, 3231 (2010) (Stevens, J., concurring); *In re Bilski*, 545 F.3d at 998 (Mayer, J., dissenting).

12. *See In re Bilski*, 545 F.3d at 974 (Dyk, J., concurring).

method” exclusion was warranted by precedent¹³ or necessary to invalidate *Bilski*’s claims as directed to an unpatentable abstract idea.¹⁴ In its invalidity ruling, the Court merely cited its precedents and the statutory text without explaining their application to the claims,¹⁵ thereby shedding little light on the question of what constitutes an unpatentable abstract idea.¹⁶ In closing, the Court expressly invited the Federal Circuit to develop “other limiting criteria that further the purposes of the Patent Act and are not inconsistent with its text.”¹⁷ Chief Judge Rader’s subsequent elaboration of the abstract-ideas doctrine explicitly referenced and responded to this invitation.¹⁸

II. CHIEF JUDGE RADER ON INVENTIONS IN THE “MARKETPLACE”

A. *Research Corp. Technologies, Inc. v. Microsoft Corp.*

In December 2010, in the Federal Circuit’s first post-*Bilski* opinion addressing the scope of the abstract-ideas exclusion, Chief Judge Rader introduced the notion that the “marketplace” can guide courts in the patent-eligibility analysis. In *Research Corp. Technologies, Inc. v. Microsoft Corp.*,¹⁹ the plaintiff asserted claims from a parent patent and various continuation patents²⁰ relating to, *inter alia*, methods for the halftoning of digital images. Digital halftoning is a technique that allows computer displays and printers to approximate an image with fewer colors or shades of gray

13. *Bilski*, 130 S. Ct. at 3227 (“The ‘machine-or-transformation’ test is not the sole test for deciding whether an invention is a patent-eligible ‘process.’”); *id.* at 3228 (“Section 101 similarly precludes the broad contention that the term ‘process’ categorically excludes business methods.”).

14. *Id.* at 3231 (“Allowing petitioners to patent risk hedging would preempt use of this approach in all fields, and would effectively grant a monopoly over an abstract idea.”).

15. *Id.* The Court noted,

The patent application here can be rejected under our precedents on the unpatentability of abstract ideas. The Court, therefore, need not define further what constitutes a patentable ‘process,’ beyond pointing to the definition of that term provided in § 100(b) and looking to the guideposts in *Benson*, *Flook* and *Diehr*.

Id.

16. *Id.* at 3236 (Stevens, J., dissenting).

17. *Id.* at 3231 (majority opinion).

18. *See* *Research Corp. Techs., Inc. v. Microsoft Corp.*, 627 F.3d 859, 868 (Fed. Cir. 2010).

19. *Id.*

20. *See id.* at 865 (describing the lineage of the six patents asserted in the case).

than the original.²¹ The most common basic approach to digital halftoning uses a “mask,” also known as a “threshold array,” to translate colors and shades on a pixel-by-pixel basis from the original image to the processed image.²² The claimed methods used a type of mask with aesthetically desirable mathematical properties called a “blue noise mask,” and the patent disclosures taught improved computer algorithms for constructing such blue noise masks.²³

In a summary judgment decision issued while the *In re Bilski* machine-or-transformation test was still controlling, the district court held three of these process claims to be invalid as directed to abstract ideas.²⁴ Claim 1 of the parent patent was representative of these claims:

A method for the halftoning of gray scale images by utilizing a pixel-by-pixel comparison of the image against a blue noise mask in which the blue noise mask is comprised of a random non-deterministic, non-white noise single valued function which is designed to produce visually pleasing dot profiles when thresholded at any level of said gray scale images.²⁵

According to the district court, “pixel-by-pixel comparison does not require a particular machine, nor does the assembly of gray scale images to generate final dot profiles mandate a further visual display or image, which would meet the transformation requirement.”²⁶

In reversing the district court, the Federal Circuit noted the Supreme Court’s refusal in *Bilski* “to provide a rigid formula or definition for abstractness.”²⁷ Accordingly, Chief Judge Rader wrote:

[T]his court also will not presume to define “abstract” beyond the recognition that this disqualifying characteristic should exhibit itself so manifestly as to override the broad statutory categories of eligible subject matter and the statutory context that directs primary attention on the patentability criteria of the rest of the Patent Act.²⁸

21. *Id.* at 863; *see also* ROBERT ULICHNEY, DIGITAL HALFTONING 1 (1987) (“*Digital halftoning* . . . refers to any algorithmic process which creates the illusion of continuous-tone images from the judicious arrangement of binary picture elements.”).

22. RESEARCH CORP. TECHNOLOGIES, BLUE NOISE MASK: PREMIER STOCHASTIC IMAGING TECHNOLOGY 1 (2006), *available at* <http://www.rctech.com/resources/downloads/BNM/BlueNoiseMask.pdf>.

23. *See* U.S. Patent No. 5,111,310 (filed Dec. 4, 1990) (issued May 5, 1992) [hereinafter ‘310 patent].

24. *Research Corp. Techs., Inc. v. Microsoft Corp.*, No. CV-01-658-TUC-RCJ, 2009 U.S. Dist. LEXIS 71883 at *52 (D. Ariz. July 28, 2009).

25. ‘310 patent, *supra* note 23, at cl. 1.

26. *Research Corp.*, 2009 U.S. Dist. LEXIS 71883 at *30.

27. *Research Corp. Techs., Inc. v. Microsoft Corp.*, 627 F.3d 859, 868 (2010).

28. *Id.*

From Justice Stevens’s concurrence in *Bilski*, Chief Judge Rader also took from the Court’s opinion a warning that “section 101 eligibility should not become a substitute for a patentability analysis related to prior art, adequate disclosure, or the other conditions and requirements of Title 35.”²⁹ According to Chief Judge Rader, the function of the patentable subject matter requirement is limited to that of a “coarse eligibility filter,” complemented by the more “powerful” abilities of the enablement and written description requirements as “tools to weed out claims that may present a vague or indefinite disclosure of the invention.”³⁰

Consistent with this “coarse” approach, the Federal Circuit’s analysis of the abstract-ideas exclusion in *Research Corp.* did not address the language of the claims in issue, but focused instead on two aspects of what the court took to be the claimed invention. First, Chief Judge Rader pointed to concrete features of the invention’s operational context, including physical elements recited in unasserted claims and the “marketplace” in which the invention might be applied:

The invention presents functional and palpable applications in the field of computer technology. These inventions address “a need in the art for a method of and apparatus for the halftone rendering of gray scale images in which a digital data processor is utilized in a simple and precise manner to accomplish the halftone rendering.” ‘310 patent col.3 ll.33-40. The fact that some claims in the ‘310 and ‘228 patents require a “high contrast film,” “a film printer,” “a memory,” and “printer and display devices” also confirm this court’s holding that the invention is not abstract. Indeed, this court notes that inventions with specific applications or improvements to technologies in the marketplace are not likely to be so abstract that they override the statutory language and framework of the Patent Act.³¹

Second, Chief Judge Rader stressed the importance of reading each claim as a whole, rather than “to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis.”³² Thus, the court found that the claims in issue were not directed to an abstract “mathematical formula,” but to “a process of halftoning in computer applications” or “aspects and applications” thereof.³³ Accordingly, the Federal Circuit reversed the district court’s invalidation of the asserted claims.³⁴

29. *Id.* (citing *Bilski v. Kappos*, 130 S. Ct. 3218, 3238 (2010) (Stevens, J., concurring)).

30. *Id.* at 869.

31. *Id.* at 868–69.

32. *Id.* at 869 (quoting *Diamond v. Diehr*, 450 U.S. 175, 188 (1981)).

33. *Id.*

34. *Id.*

In using the phrase “not likely to be so abstract” rather than “not so abstract,” Chief Judge Rader left open the question of precisely how considerations of the “marketplace” are to bear on the abstract-ideas analysis. One possible reading is that such considerations are superfluous, in that the *Research Corp.* holding is “confirm[ed]” by the court’s observation about the “marketplace,” but in no way relies upon it. A different Federal Circuit panel recently suggested such an interpretation in commenting on Chief Judge Rader’s consideration of the film, printer, memory and display devices recited in the unasserted dependent claims in *Research Corp.*³⁵

A recent district court decision, however, treated Chief Judge Rader’s “marketplace” language as a “standard” by which a process can be found to be patentably “specific and concrete.” In *Glory Licensing LLC v. Toys “R” Us, Inc.*,³⁶ Glory asserted claims directed to “processes involving the extraction of information entered into and stored in a document or file and the formatting and transmission of that information to an application program.”³⁷ Toys “R” Us moved to dismiss, arguing that the claims were directed to unpatentable abstract ideas.³⁸ At oral argument, Glory cited the Federal Circuit’s decision in *Research Corp.* for the proposition that “functional and palpable applications in the field of computer technology” were not unpatentably abstract.³⁹ Although the district court rejected Glory’s argument as untimely,⁴⁰ it proceeded to find the *Research Corp.* claims “far more specific and concrete than those at issue in the instant action.”⁴¹ Specifically, the court found, “While the Federal Circuit noted that ‘inventions with specific applications or improvements to technologies in the marketplace are not likely to be so abstract that they override the statutory lan-

35. See *Fuzzysharp Techs., Inc. v. 3DLabs Inc.*, 447 Fed. App’x 182 (Fed. Cir. Nov. 4, 2011) (per curiam). The court in *Fuzzysharp* noted that:

There is no basis for looking to other claims except to the extent that they inform the meaning of the challenged claims through claim differentiation. [Patentee] argues that this court looked to elements recited in unasserted claims in [*Research Corporation*]. In fact, however, the court in that case concluded that the asserted claims were patent-eligible without looking to unasserted claims and then simply noted that elements recited in unasserted claims “confirm this court’s holding that the invention is not abstract.

Id. at 185 (citing *Research Corp.*, 627 F.3d at 859).

36. *Glory Licensing LLC v. Toys “R” Us, Inc.*, No. 09-4252, 2011 U.S. Dist. LEXIS 51888 (D.N.J. May 16, 2011).

37. *Id.* at *11 (citing U.S. Patents Nos. 6,683,697; 7,075,673; & 7,672,007).

38. *Id.* at *1, *4.

39. *Id.* at *14–15 & n.8.

40. *Id.* at *14 (concluding that Glory’s failure to cite factors beyond the “machine or transformation” test in its opposition brief effectively “waived any argument” that the court should consider such factors).

41. *Id.* at *14–16 & n.8.

guage and framework of the Patent Act,’ that standard is simply not met by the *Glory* Patents.”⁴²

The *Glory* court’s bare conclusion that “that standard is simply not met” is notably lacking in doctrinal guidance. If *Research Corp.*’s “marketplace” considerations are to be recognized as a standard in the patentability analysis of claims, courts will need to clarify the form and substance of the inquiry. As a review of two subsequent Federal Circuit decisions will show, judicial pronouncements on the “marketplace” thus far have been unilluminating.

B. *Classen*

The Federal Circuit’s divided panel opinion in *Classen Immunotherapies, Inc. v. Biogen IDEC*⁴³ highlights a significant ambiguity in Chief Judge Rader’s formulation of the “marketplace” inquiry. In *Classen*, the patentee asserted process claims purportedly covering the act of reviewing the scientific literature relating to risks of developing a chronic immune-mediated disorder.⁴⁴ Some of the claims recited a further step of immunizing a patient in accordance with the schedule that appears from the relevant literature to have the lowest risk.⁴⁵ The defendants moved for summary judgment, arguing, *inter alia*, that the claims were directed to patent-ineligible subject matter.⁴⁶ The district court granted the motion, holding that each of the claims in issue was directed to an unpatentable abstract idea.⁴⁷ The Federal Circuit’s initial decision affirmed under the machine-or-transformation test, but the Supreme Court vacated and remanded the decision after *Bilski v. Kappos*.⁴⁸

In a decision authored by Judge Pauline Newman and joined by Chief Judge Rader, the majority found that the claims that included the “physical” immunization step were “directed to a specific, tangible application, as in *Research Corporation*,” and therefore satisfied “the coarse eligibility filter of § 101.”⁴⁹ In contrast, the claims lacking this physical step did not put “knowledge to practical use,” and were therefore ineligible as “directed to the abstract principle that variation in immunization schedules may have consequences for certain diseases.”⁵⁰

42. *Id.*

43. *Classen Immunotherapies, Inc. v. Biogen IDEC*, 659 F.3d 1057 (Fed. Cir. 2011).

44. *Id.* at 1061.

45. *Id.*

46. *Id.* at 1062.

47. *Id.*

48. *Id.* at 1062–63.

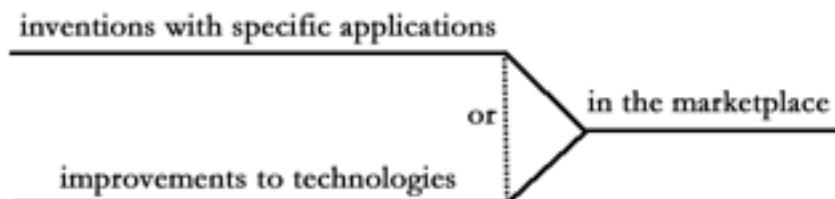
49. *Id.* at 1066.

50. *Id.* at 1067.

Judge Kimberly Moore dissented, stating that she would have affirmed the district court in holding all of the asserted claims to be directed to unpatentable abstract ideas.⁵¹ She specifically challenged the notion that “marketplace” considerations could distinguish Classen’s claimed physical immunization processes from Bernard Bilski’s processes for facilitating the offering of “fixed bill” energy contracts⁵² or Dale Flook’s methods for detecting abnormal conditions in the catalytic conversion of hydrocarbons.⁵³ As Judge Moore wrote:

In reaching its conclusion that the [physical immunization] patent claims are directed to patent eligible subject matter, the majority relies heavily on *Research Corp. . . . Research Corp.* explains that claims “are not likely to be so abstract that they” recite nonstatutory subject matter if they are directed to “inventions with specific applications or improvements to technologies in the marketplace.” In my view, the claimed inventions in *Bilski* and *Flook* have specific applications to the marketplace, but those claims nonetheless recite nonstatutory subject matter under § 101.⁵⁴

At the heart of the disagreement between Judge Moore and the majority is a syntactic ambiguity in Chief Judge Rader’s statement that “inventions with specific applications or improvements to technologies in the marketplace are not likely to be so abstract that they override the statutory language and framework of the Patent Act.”⁵⁵ In Judge Moore’s reading, the qualifier “in the marketplace” applies over both sides of the disjunctive “or.” Since the unpatentable *Bilski* and *Flook* inventions satisfy the test as “inventions with specific applications in the marketplace,” Judge Moore finds the test insufficient to assure patent-eligibility.⁵⁶



51. *Id.* at 1076 (Moore, J., dissenting).

52. *See Bilski v. Kappos*, 130 S. Ct. 3218, 3233 (2010).

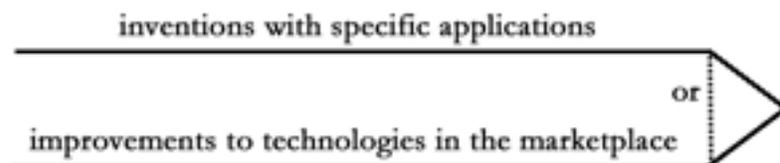
53. *See Parker v. Flook*, 437 U.S. 584, 585–86 (1978).

54. *Classen*, 659 F.3d at 1081 (Moore, J., dissenting) (citations omitted).

55. *Research Corp. Technologies v. Microsoft Corp.*, 627 F.3d 859, 869 (Fed. Cir. 2010).

56. *Classen*, 659 F.3d at 1080–81 (Moore, J., dissenting) (“Nor do I understand the test the majority proposes for determining patentability under § 101.”).

In contrast, the relevant finding in the majority’s analysis is simply that the physical immunization method claims were “directed to a specific, tangible application,” without reference to any “marketplace” in which the claimed methods might be applied.⁵⁷ According to this parsing of Chief Judge Rader’s statement in *Research Corp.*, the qualifier “in the marketplace” applies only to the immediately preceding phrase “improvements to technologies.”



The discrepancy between the two syntactic approaches implicates the substantive question of where to look for indicia of specificity. Judge Moore looks to the marketplace, and finds Bilski’s and Flook’s claimed methods being applied in indisputably commercial settings.⁵⁸ The majority, however, being unconstrained by the “marketplace” qualifier, looks to tangibility, and finds the physical act of immunization sufficient to move at least some of Classen’s claimed subject matter “from abstract scientific principle to specific application.”⁵⁹ Despite the majority’s apparently heavy reliance on *Research Corp.*,⁶⁰ “marketplace” considerations end up having no bearing on the outcome of the case.

C. *Ultramercial v. Hulu*

Unlike *Research Corp.*’s claims, the process claims in issue in *Ultramercial v. Hulu* expressly recited sequences of steps in a market transaction, providing the best opportunity yet for Chief Judge Rader to clarify the respective roles of claim elements and the “marketplace” in his analysis.⁶¹ The market in question is a familiar one to every couch potato: advertisers sponsor the viewing of a TV show by paying a broadcaster to insert the advertiser’s message into the show’s broadcast. Ultramercial’s invention provides the necessary software for an Internet broadcaster to perform various functions in its analogous dealings with content providers, advertisers and viewers.

57. *Id.* at 1066 (majority opinion).

58. *See supra* text accompanying notes 52–54.

59. *See supra* text accompanying notes 49–50.

60. *See Classen*, 659 F.3d at 1081 (Moore, J., dissenting).

61. *Ultramercial, LLC v. Hulu, LLC*, 657 F.3d 1323 (Fed. Cir. 2011).

In *Ultramercial*, the patentee asserted claims reciting such steps as “providing said media products for sale on an Internet website” and “restricting general public access to said media product.”⁶² The defendants moved to dismiss for lack of patentable subject matter.⁶³ Having stayed the case pending the Supreme Court’s decision in *Bilski*, the district court issued a decision promptly thereafter, applying both the Federal Circuit’s machine-or-transformation test and the Supreme Court’s more holistic preemption analysis.

In applying the former test, the district court noted that the claims recited the “Internet,”⁶⁴ and that “the only useful application of Plaintiff’s invention is with relation to the Internet, where the facilitator is a specifically ‘programmed computer.’”⁶⁵ The court reasoned, however, that “the Inter-

62. Representative claim 1 of the patent reads:

A method for distribution of products over the Internet via a facilitator, said method comprising the steps of: a first step of receiving, from a content provider, media products that are covered by intellectual-property rights protection and are available for purchase, wherein each said media product being comprised of at least one of text data, music data, and video data; a second step of selecting a sponsor message to be associated with the media product, said sponsor message being selected from a plurality of sponsor messages, said second step including accessing an activity log to verify that the total number of times which the sponsor message has been previously presented is less than the number of transaction cycles contracted by the sponsor of the sponsor message; a third step of providing the media product for sale at an Internet website; a fourth step of restricting general public access to said media product; a fifth step of offering to a consumer access to the media product without charge to the consumer on the precondition that the consumer views the sponsor message; a sixth step of receiving from the consumer a request to view the sponsor message, wherein the consumer submits said request in response to being offered access to the media product; a seventh step of, in response to receiving the request from the consumer, facilitating the display of a sponsor message to the consumer; an eighth step of, if the sponsor message is not an interactive message, allowing said consumer access to said media product after said step of facilitating the display of said sponsor message; a ninth step of, if the sponsor message is an interactive message, presenting at least one query to the consumer and allowing said consumer access to said media product after receiving a response to said at least one query; a tenth step of recording the transaction event to the activity log, said tenth step including updating the total number of times the sponsor message has been presented; and an eleventh step of receiving payment from the sponsor of the sponsor message displayed.

U.S. Patent No. 7,346,545 (issued Mar. 18, 2008).

63. *Ultramercial v. Hulu, LLC*, No. 09-06918, 2010 U.S. Dist. LEXIS 93453 (C.D. Cal. Aug. 13, 2010), *rev’d*, 657 F.3d 1323 (Fed. Cir. 2011).

64. *Id.* at *9–10.

65. *Id.* at *13.

net is not a machine,”⁶⁶ and the fact “[t]hat the disclosed invention is only used on computers or computer networks cannot alone satisfy the machine test without rendering the test completely toothless.”⁶⁷ Accordingly, the court concluded that the claimed process neither was “tied to a particular machine” nor “transform[ed] an article.”⁶⁸

The court proceeded to perform a holistic comparison between *Ultramercial* and *Bilski*, finding that the “core principle” of Ultramercial’s patent was “the basic idea that one can use advertisement as an exchange or currency,” an abstract idea “similar to the core of the *Bilski* patent.”⁶⁹ The court also reasoned that Ultramercial’s patent was made no less abstract by the use of the Internet, a facilitator, passwords and activity logs; as in *Bilski*, “the patent still discloses an abstract idea garnished with accessories.”⁷⁰ In light of these similarities, the court concluded that the patent did not cover patentable subject matter and granted Hulu’s motion to dismiss.⁷¹

The Federal Circuit’s panel decision on appeal,⁷² authored by Chief Judge Rader, recapitulated and extended the *Research Corp.* opinion’s discussion of the abstract-ideas exclusion. Chief Judge Rader reiterated that the patentable subject matter requirement is “no more than a ‘coarse eligibility filter’”⁷³ and that unpatentable abstractness “should exhibit itself so manifestly as to override the broad statutory categories of eligible subject matter and the statutory context that directs primary attention on the patentability criteria of the rest of the Patent Act.”⁷⁴ He then went on to provide a new gloss on the Supreme Court’s abstract-ideas jurisprudence in *Benson*,⁷⁵ *Flook*⁷⁶ and *Diehr*,⁷⁷ reasoning that “the Patent Act covers and protects any new and useful technical advance, including applied ideas.”⁷⁸ Accordingly, the court undertook to “focus[] its inquiry on the abstractness of the subject matter claimed” by Ultramercial.⁷⁹

66. *Id.* at *10 (citing *Cybersource Corp. v. Retail Decisions, Inc.*, 620 F. Supp. 2d 1068 (N.D. Cal. 2009)) (“[T]he Internet is an abstraction.”).

67. *Id.* at *13.

68. *Id.* at *6–16.

69. *Id.* at *17.

70. *Id.* at *18.

71. *Id.* at *19–20.

72. *Ultramercial, LLC v. Hulu, LLC*, 657 F.3d 1323 (Fed. Cir. 2011).

73. *Id.* at 1326 (quoting *Research Corp. Techs. v. Microsoft Corp.*, 627 F.3d 859, 869 (Fed. Cir. 2010)).

74. *Id.* at 1327.

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

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

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

78. *Ultramercial*, 657 F.3d at 1327.

79. *Id.* at 1328.

To frame its abstractness inquiry, the court returned to *Research Corp.*'s characterization of "inventions with specific applications or improvements to technologies in the marketplace."⁸⁰ The court found that Ultramercial's invention:

[S]eeks to remedy problems with prior art banner advertising, such as declining click-through rates, by introducing a method of product distribution that forces consumers to view and possibly even interact with advertisements before permitting access to the desired media product. By its terms, the claimed invention purports to improve existing technology in the marketplace.⁸¹

The Federal Circuit acknowledged the district court's finding that "the mere idea that advertising can be used as a form of currency is abstract, just as the vague, unapplied concept of hedging proved patent-ineligible in *Bilski*," but went on to point out that many of Ultramercial's claim limitations "are likely to require intricate and complex computer programming" and "clearly require specific application to the Internet and a cyber-market environment."⁸² For example, the third step of claim 1 recites "providing said media products for sale on an Internet website," and the fourth step recites "restricting general public access to the media products."⁸³

Having noted these facts, the court concluded that it "simply [found] the claims here to be patent-eligible, *in part* because of these factors."⁸⁴ In so doing, it expressly declined to hold that "programming complexity" or "use of an Internet website to practice . . . a [computer-implemented] method" is necessary or sufficient to satisfy § 101.⁸⁵ Chief Judge Rader's opinion, however, did not cite any other facts about the claimed invention in support of the court's patent-eligibility finding.⁸⁶ The Federal Circuit's de-

80. *Id.* at 1328 (quoting *Research Corp. Techs. v. Microsoft Corp.*, 627 F.3d 859, 869 (Fed. Cir. 2010) ("[I]nventions with specific applications or improvements to technologies in the marketplace are not likely to be so abstract that they override the statutory language and framework of the Patent Act.")).

81. *Id.* (citation omitted).

82. *Id.*

83. See *supra* note 62.

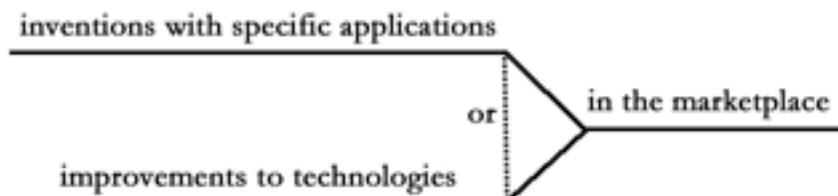
84. *Ultramercial*, 657 F.3d at 1328 (emphasis added).

85. *Id.*

86. The only facts about Ultramercial's invention discussed in the remainder of the opinion are that it "does not specify a particular mechanism for delivering media content to the consumer," and that the claims require, *inter alia*, "controlled interaction with a consumer via an Internet website . . ." *Id.* at 1329–30. The court cited the former not in support of its patent-eligibility finding, but in pointing out that many overbreadth concerns can be addressed by the requirements of § 112. *Id.* at 1329. The latter fact is merely a paraphrase of the same claim limitations discussed earlier, and is cited only in response to the suggestion that Ultramercial's invention falls under the mental-steps exclusion, a subcategory of the abstract-ideas exclusion. *Id.* at 1329–30.

termination that *Ultramercial*’s invention is not unpatentably abstract thus appears to rest heavily, if not exclusively, on the *Research Corp.* inquiry.

At first glance, it may appear that Chief Judge Rader’s *Ultramercial* analysis read the qualifier “in the marketplace” into both prongs of the *Research Corp.* inquiry, as Judge Moore did in *Classen*.⁸⁷



With respect to the first prong, Chief Judge Rader in *Ultramercial* pointed out claim limitations that “clearly require specific application to the Internet and a cyber-market environment.”⁸⁸ Addressing the second prong, he specifically found that “the claimed invention purports to improve existing technology in the marketplace.”⁸⁹ The marketplace is thus cited in each finding as a context that fixes the characterization of the invention at a patentably concrete level of abstraction.⁹⁰

Even so, it is difficult to attach doctrinal weight to *Ultramercial*’s “marketplace” considerations, at least if Chief Judge Rader intends to maintain his determination that the *Bilski* claims were unpatentably abstract.⁹¹ As Judge Moore’s *Classen* dissent pointed out, *Bilski*’s claimed processes also have specific applications to the marketplace.⁹² Moreover, the calculations outlined in *Bilski*’s patent specification are at least as likely as *Ultramercial*’s methods to require intricate and complex computer programming.⁹³ *Bilski*’s claimed methods of market-making in fixed-price commodity contracts, however, need not be performed in connection with the Internet.⁹⁴ Chief Judge Rader’s analysis of the first prong must therefore be understood as turning on the claimed process’s applicability not to markets in general, but to an *Internet*-facilitated “cyber-market.” It is a

87. See *supra* text accompanying note 56.

88. *Ultramercial*, 657 F.3d at 1328.

89. *Id.*

90. See *id.*

91. See *In re Bilski*, 545 F.3d 943, 1011 (Fed. Cir. 2008) (Rader, J., dissenting).

92. *Classen Immunotherapies, Inc. v. Biogen IDEC*, 659 F.3d 1057, 1081 (Fed. Cir. 2011) (Moore, J., dissenting).

93. See Joint Appendix at A-81 to A-87, *In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008) (No. 07-1130), available at http://www.uspto.gov/web/offices/com/sol/2007-1130bilski_joint_appendix.pdf (providing a detailed description of the invention).

94. See *supra* text accompanying note 5.

technological—not an *economic*—characteristic of the claimed invention that confers patentable concreteness here.

The *Bilski* machine-or-transformation inquiry is capable of drawing this distinction, independent of “marketplace” considerations, as long as the Internet is understood as a “particular machine.” Despite the latent ambiguity in this inquiry⁹⁵ and the frequent characterization of the Internet itself as an abstraction,⁹⁶ there is strong support for finding Internet-mediated transactions such as those described in Ultramercial’s process claims to be “tied to a particular machine.” As its capitalization suggests, the Internet is a proper noun signifying that it is a particular entity; i.e., “the global inter-network of TCP/IP networks that we all know and use.”⁹⁷ While no specific physical component of the Internet is necessary to its existence,⁹⁸ the Internet’s root name servers provide an identity criterion for the Internet,⁹⁹ at least under a causal theory of reference.¹⁰⁰ Namely, the Internet known and used by all of us is the internetwork that uses thirteen specified root name servers (i.e., {A–M}.root-servers.net)¹⁰¹ to support its Domain Name System (DNS).¹⁰² Even though the root name servers are physically and geo-

95. See *Bilski*, 545 F.3d at 994 (Newman, J., dissenting) (noting that in the majority’s “machine-or-transformation” test, “[w]e aren’t told when, or if, software instructions implemented on a general purpose computer are deemed ‘tied’ to a ‘particular machine’”).

96. See, e.g., *Cybersource Corp. v. Retail Decisions, Inc.*, 620 F. Supp. 2d 1068, 1077 (N.D. Cal. 2009) (“Yet the Internet is an abstraction. . . . One can touch a computer or a network cable, but one cannot touch ‘the [I]nternet.’”); DOUGLAS E. COMER, *COMPUTER NETWORKS AND INTERNETS* 345 (5th ed. 2009) (“The chief difference between the Internet and a physical network is that the Internet is an abstraction imagined by its designers and created entirely by protocol software.”).

97. CHARLES M. KOZIEROK, *THE TCP/IP GUIDE: A COMPREHENSIVE, ILLUSTRATED INTERNET PROTOCOLS REFERENCE* 30 (2005) (“The generic noun *internetwork* is a short form for the word internetwork, while the proper noun *Internet* refers to the global internetwork of TCP/IP networks that we all know and use.”).

98. See generally BARRIE SOSINSKY, *NETWORKING BIBLE* 456 (2009) (“The Internet was designed to be a highly redundant mesh structure that could survive any outages to a substantial portion of the network and still be operable.”).

99. See BLACKWELL PUBLISHING, INC., *A COMPANION TO METAPHYSICS* 330 (Jaegwon Kim et al. eds., 2d ed. 2009) (defining the criterion of identity).

100. See SAUL A. KRIPKE, *NAMING AND NECESSITY* (1980); 2 HILARY PUTNAM, *The Meaning of “Meaning,”* in *MIND, LANGUAGE AND REALITY: PHILOSOPHICAL PAPERS* 215 (1975).

101. See ROOT SERVER TECHNICAL OPERATIONS ASS’N (Apr. 7, 2012), <http://www.root-servers.org> (providing current status information on the group of thirteen named root name servers).

102. See NAT’L RESEARCH COUNCIL OF THE NAT’L ACADS., *SIGNPOSTS IN CYBERSPACE: THE DOMAIN NAME SYSTEM AND INTERNET NAVIGATION* 80–86 (2005) (describing the involvement of the root name server in the resolution of DNS queries); WILLIAM STALLINGS, *DATA AND COMPUTER COMMUNICATIONS* 774 (8th ed. 2007) (describing the DNS as “essen-

graphically disparate,¹⁰³ a global convergence on specifications for their functionalities has provided a detailed basis for the identification and use of the Internet in practice.¹⁰⁴ Because of these functional specifications, root name servers should be recognized as specific technologies supporting Internet-mediated causal interactions and meaningfully limiting the scope of Internet-mediated processes.¹⁰⁵ Accordingly, processes requiring use of the Internet’s DNS (and, therefore, use of the root name servers) should be found to be “tied to a particular machine.”

Compared with the “machine-or-transformation” inquiry, Chief Judge Rader’s analysis of the second prong, consisting solely of the finding that “the claimed invention purports to improve existing technology in the marketplace,”¹⁰⁶ is less informative, and ultimately provides no analytical basis for distinguishing Bilski’s claimed improvements to commodity market-making processes¹⁰⁷ from “improvements to technologies in the marketplace.” As discussed in Section III, it is difficult to attribute any *economic* meaning to the phrase “improvements to technologies in the marketplace” that does not encompass Bilski’s processes. *Ulramercial’s* “marketplace” considerations can therefore enter into patent law’s abstract-ideas doctrine, if at all, only through *technological* indicia that closely resemble the post-*Bilski* machine-or-transformation “clue.”

tial to the functioning of the Internet”); Markus Müller, *Who Owns the Internet? Ownership as a Legal Basis for American Control of the Internet*, 15 *FORDHAM INTELL. PROP. MEDIA & ENT. L.J.* 709, 713–19 (2005) (describing the importance of the root file to the operation of the DNS and the infeasibility of any alternative).

103. Hardware and software implementations of the Internet’s thirteen root name servers may vary widely, *see* NAT’L RESEARCH COUNCIL OF THE NAT’L ACADS., *supra* note 102, at 102 (“There is no standard hardware and software implementation of the root name servers.”), and may incorporate multiple physical systems in locations throughout the world. *See id.* at 101–03 (describing the use of “satellite sites at different locations” to implement root servers).

104. *See generally* DNS RFCs, INTERNET SYS. CONSORTIUM, <http://www.isc.org/community/reference/RFCs/DNS> (last visited May 27, 2012) (compiling specifications and standards for DNS protocols).

105. *See* Aaron Sloman, *Evolution of Mind as a Feat of Computer Systems Engineering: Lessons from Decades of Development of Self-Monitoring Virtual Machinery* 7 (Jul. 16, 2011), Draft presented at the Pierre Duhem Conference (July 19, 2011), *available at* <http://www.cs.bham.ac.uk/research/projects/cogaff/sloman-sps-2011.pdf> (listing “name-servers” among the computer technologies that “support[] the causal interactions” between computer systems and their external environments).

106. *Ulramercial, LLC v. Hulu, LLC*, 657 F.3d 1323, 1328 (Fed. Cir. 2011) (citation omitted).

107. *See supra* Part I.

III. THE “MARKETPLACE” RECONSIDERED

The abstract concept “marketplace” can embrace a variety of economic activities within the recognized concerns of patent law. Here, we describe two possible approaches to characterizing claimed inventions as “improvements to technologies in the marketplace” in the context of these activities and concerns. The first emphasizes the marketplace as a site of production; the second focuses on competition in the marketplace.

A. *Endogenous Growth Theory and Market Production*

The production economics literature has usually represented the notion of improvements to technologies as upward shifts in the *production frontier*,¹⁰⁸ i.e., the curve representing the maximum output attainable from each level of inputs.¹⁰⁹ Quantitatively, the technical relationship between inputs and outputs takes the form of a production function: e.g., the function f in the equation $q = f(x)$ in which q represents output and x is a vector of inputs.¹¹⁰

In his influential theory of endogenous growth,¹¹¹ economist Paul Romer departs from this approach by regarding the state of technology as an input to the production function, rather than the production function itself. Specifically, Romer described “the design for a new good” as a non-rival input, in that “[o]nce the design is created, it can be used as often as desired, in as many productive activities as desired.”¹¹² Thus, Romer uses the form $F(A,X)$ to represent a production process that depends on rival inputs X and nonrival inputs A ,¹¹³ wherein A may include product designs.¹¹⁴ Romer assumes that all inputs to F are productive and that replication of the production process is possible; i.e., $F(A,\lambda X) = \lambda F(A,X)$.¹¹⁵

Romer’s theory has been celebrated for its representation of market incentives that drive technological change.¹¹⁶ A critical observation underlying Romer’s model is that while “[t]he vast majority of designs result

108. See TIMOTHY J. COELLI ET AL., AN INTRODUCTION TO EFFICIENCY AND PRODUCTIVITY ANALYSIS 4 (2d ed. 2005).

109. *Id.* at 3.

110. *Id.* at 12 & n.2.

111. See Paul M. Romer, *Endogenous Technological Change*, 98 J. POL. ECON. S71 (1990).

112. *Id.* at S74.

113. *Id.* at S76.

114. See *id.* at S74.

115. See *id.* at S76.

116. See, e.g., LEWIS-GUODO LIU & ROBERT PREMUS, GLOBAL ECONOMIC GROWTH: THEORIES, RESEARCH, STUDIES, AND ANNOTATED BIBLIOGRAPHY, 1950–1997, at 2 (2000) (describing Romer’s work as “pioneering”).

from the research and development activities of private, profit-maximizing firms,”¹¹⁷ a price-taking producer could not afford to pay anything for the nonrival inputs *A*.¹¹⁸ Romer’s solution is to introduce market power explicitly in the form of patents,¹¹⁹ so that intentional, private investments in developing designs can be compensated out of quasi rents.¹²⁰

Romer’s endogenous growth model can thus be interpreted as an economic justification for the patent-eligibility of improvements to technologies in the marketplace. Under this interpretation, an invention should be found patent-eligible if it is a nonrival input to a replicable process that also has rival inputs.

Such a rule, however, does not provide a basis for distinguishing between *Bilski* and *Ulramercial*. In each of these cases, the inputs to the claimed process are the parties to the recited transaction. The inputs are rivalrous (assuming each party’s demand for such transactions is fixed), and the process is replicable (assuming the potential market for such transactions is sufficiently large). Endogenous growth theory therefore does not appear to provide an economic criterion for patentably concrete “improvements to technologies in the marketplace.”

B. Trade Secret Law and Market Competition

At the heart of trade secret law is a notion akin to “improvement to technologies in the marketplace.” The definition of trade secret requires that the subject matter “derive[] independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use.”¹²¹ If it can be assumed that the relevant “marketplace” includes all persons who could obtain economic value from a claimed invention’s disclosure or use and that “improvements to technologies” provide independent economic value to those with special knowledge, then trade secret law could supply the necessary analytical underpinnings for Chief Judge Rader’s considerations. In effect, a claimed invention would be recognized as a patentably concrete “improvement to technologies in the marketplace” if it could have been the subject of a trade secret.

117. See Romer, *supra* note 111, at S74.

118. See *id.* at S76 (“If all inputs were paid their value marginal product, the firm would suffer losses.”).

119. See *id.* at S81 (“Once a firm has produced a design for durable *i*, it can obtain an infinitely lived patent on that design.”).

120. See *id.* at S77–S78.

121. UNIF. TRADE SECRETS ACT § 1(4)(i) (1985), available at <http://www.law.upenn.edu/bll/archives/ulc/fnact99/1980s/utsa85.pdf>.

Unfortunately, such an approach is at odds with the complementary relationship between patent and trade secret law, which relies in large part on the distinction between economically valuable knowledge and patentable inventions.¹²² The category of trade secrets includes such proprietary information as business plans, customer lists, and “negative know-how” (e.g., disadvantageous approaches to a problem), none of which have yet been recognized as patentable subject matter.¹²³ Accordingly, the Supreme Court has declined to find that federal patent law preempts the field occupied by state trade secret law.¹²⁴

A further difficulty in relying on the definition of a trade secret as a gloss for Chief Judge Rader’s “marketplace” considerations is that the trade secret inquiry requires fact-finding as to the information “generally known to, and not being readily ascertainable by proper means by, other persons.”¹²⁵ The fact that Chief Judge Rader did not consult sources beyond the patent document in considering the “marketplaces” in *Research Corp.* and *Ulramercial* suggests that he looked to the “Background of the Invention” section of the patent document as a description of the state of the prior art. However, the background section is a poor proxy for trade secret law’s “general knowledge” inquiry, because it is often drafted with a view to limiting disclosure rather than providing a comprehensive account of generally known information.¹²⁶ Like endogenous growth theory,¹²⁷ trade secret law does not appear to supply a suitable analytical framework for determining whether a claimed invention constitutes an “improvement to technologies in the marketplace.”

122. See *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 485 (1974) (“Trade secret law will encourage invention in areas where patent law does not reach, and will prompt the independent innovator to proceed with the discovery and exploitation of his invention. Competition is fostered and the public is not deprived of the use of valuable, if not quite patentable, invention.”).

123. See Mark A. Lemley, *The Surprising Virtues of Treating Trade Secrets as IP Rights*, 61 STAN. L. REV. 311, 331 & nn.78–79 (2008).

124. See *Kewanee*, 416 U.S. at 484–85.

125. UNIF. TRADE SECRETS ACT § 1(4)(i).

126. See Robert A. Migliorini, *The Dedication to the Public Doctrine and Lessons for Patent Practitioners*, 87 J. PAT. & TRADEMARK OFF. SOC’Y 825, 840 (2005) (advising attorneys to “limit[] the background of the invention section to the problems encountered with the current state of the art” and to “avoid disclosing subject matter that is not claimed, but that could be potentially utilized with the invention”).

127. See *supra* Part III.A.

IV. EPILOGUE: *MAYO*

The Supreme Court did not intend for *Bilski* to be the last word on patentable subject matter,¹²⁸ and less than two years passed before the Court issued its next major decision in the area: *Mayo v. Prometheus*.¹²⁹ *Mayo* presents the Federal Circuit with fresh challenges as it endeavors to develop a coherent and practicable patentable subject matter doctrine that is consistent with *Bilski* and other Supreme Court precedents.¹³⁰ The greatest disruption will likely be caused by the *Mayo* Court’s reductionist approach to the claims at issue,¹³¹ which is at least in tension with the longstanding requirement that § 101 eligibility inquiries must be addressed to patent claims “considered as a whole.”¹³² But *Mayo* can also be read as putting to rest any notion that the specification of a “marketplace” as the operational context for a claimed invention is relevant to the abstract-ideas doctrine.

Each claim at issue in *Mayo* recited

(1) an “administering” step—instructing a doctor to administer the drug to his patient—(2) a “determining” step—telling the doctor to measure the resulting metabolite levels in the patient’s blood—and (3) a “wherein” step—describing the metabolite concentrations above which there is a likelihood of harmful side-effects and below which it is likely that the drug dosage is ineffective, and informing the doctor that metabolite concentrations above or below these thresholds “indicate a need” to decrease or increase (respectively) the drug dosage.¹³³

The Court found that the “administering” step “simply refers to the relevant audience, namely doctors who treat patients with certain diseases with thiopurine drugs,” and noted that “doctors used thiopurine drugs to treat patients suffering from autoimmune disorders long before anyone asserted these claims.”¹³⁴ If the Court had considered the “marketplace” relevant to patent-eligibility, its specific finding of an existing market for thiopurine drug treatment would immediately have led to the conclusion that the claimed invention represented an “improvement to technologies in the

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

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

130. In *Mayo*, the Federal Circuit had already given specific consideration to the case in light of the Supreme Court’s *Bilski* decision. See *Prometheus Labs., Inc. v. Mayo Collaborative Servs.*, 628 F.3d 1347, 1349 (2010). The Supreme Court unanimously reversed the Federal Circuit. *Mayo*, 132 S. Ct. at 1305.

131. See *Mayo*, 132 S. Ct. at 1297–98 (finding that the “administering” and “determining” steps and “wherein” clause do not add anything “significant” to the law of nature underlying the invention, whether taken separately or in combination).

132. *Diamond v. Diehr*, 450 U.S. 175, 188 (1981).

133. *Mayo*, 132 S. Ct. at 1290–91 (syllabus).

134. *Id.* at 1297.

marketplace.” The Court, however, did not draw such an inference. Instead, it characterized the “administering” step as a mere “attempt[] to limit the use of the formula to a particular technological environment,” and therefore insufficient to overcome the prohibition against patenting abstract ideas.¹³⁵

CONCLUSION

Chief Judge Rader’s doctrinal effort to ground patentable concreteness in the economic abstraction of the marketplace suffers from syntactic ambiguity, does not explain the outcome of any case, evades economic interpretation, and has now been at least sidestepped by the Supreme Court. It is time to put whatever is left of the “marketplace” doctrine to rest.

135. *Id.* (citing *Bilski v. Kappos*, 130 S. Ct. 3218, 3230 (2010)).