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Software Patents: A One-Year Review of *Alice v. CLS Bank*

Jasper L. Tran*

Abstract

This Article investigates Alice's effects at its one-year anniversary by reviewing how the courts, namely the PTAB, district courts and the Federal Circuit, have applied Alice since its issuance. As of June 19, 2015, Alice was cited in 198 PTAB decisions, 63 district court decisions, and 11 Federal Circuit opinions, in a total of 272 court cases, to invalidate patents under § 101—totally 286 invalidations out of 345 patents or patent applications appeared before the courts at an average invalidation rate of 82.9%.

This Article estimates that—without accounting for selection bias—out of roughly 240,000 current patents in force related to computer-implemented inventions as of 2015, about 199,000 of those would likely be invalid patents under Alice, leaving about 41,000 valid patents. But patentee needs not to worry, patents are presumed valid until challenged and invalidated. Thus, if a patent owner wants to enforce his/her software patent against alleged infringers, it is better to take a settlement than taking the patent to court, risking it being invalidated.

*B.S. Chemistry and B.A. Neurobiology, University of California, Berkeley; J.D. *magna cum laude*, Health Law and Bioethics, University of Minnesota. Sincere thanks to Eli Dourado and Brad Greenberg for their comments on earlier drafts, and to Google, Inc. and the Mercatus Center at George Mason University for funding this Article's research. The views expressed herein are solely those of the author, not his employer, sponsor or affiliated institution. The author can be reached at tran4lr@gmail.com.

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Introduction

On June 19, 2014, the U.S. Supreme Court decided *Alice Corp. v. CLS Bank Int'l*,¹ refining what qualifies as patent-eligible, potentially shutting out a broad range of previously acceptable subject matter. Out of the gate, some individuals expressed "much consternation as to the potential mischief being wrought by the Court; some forecasted the demise of business methods patents and others hailed [*Alice*] as a major blow against abusive patent practices."²

Following *Alice*, 830 patent applications were withdrawn from the U.S. Patent and Trademark Office³ ("PTO") between July 1 and August 15, 2014.⁴ By December 15, 2014, *Alice* was cited in 32 district court decisions and 4 Federal Circuit opinions to invalidate patents under 35 U.S.C. § 101.⁵

¹134 S. Ct. 2347 (2014).

²Tristan Gray–Le Coz & Charles Duan, *Apply It to the USPTO: Review of the Implementation of Alice v. CLS Bank in Patent Examination*, 2014 PATENTLY-O PATENT L.J. 1, 2 (2014).

³The PTO is a federal agency that grants U.S. patents and registers trademarks. See generally *About Us*, USPTO (Feb. 12, 2015, 11:51AM) <http://www.uspto.gov/about/index.jsp> (last visited June 16, 2015).

⁴See *id.* at 3.

⁵See Jennifer A. Albert et al., *Impact of the Alice V. CLS Bank Decision – A Year-End Review*, GOODWIN PROCTER: IP ALERT (Dec. 19, 2014), <http://www.goodwinprocter.com/Publications/Newsletters/IP-Alert/2014/1219-Impact-of-the-Alice-V-CLS-Bank-Decision.aspx?article=1>.

This Article investigates *Alice*'s effects at its one-year anniversary by reviewing how the courts, namely the Patent Trial and Appeal Board⁶ ("PTAB"), district courts and the Federal Circuit, have applied *Alice* since its issuance. As of June 19, 2015, *Alice* was cited in 198 PTAB decisions, 63 district court decisions, and 11 Federal Circuit opinions, in a total of 272 court cases, to invalidate patents under § 101—totaling 286 invalidations out of 345 patents or patent applications which appeared before the courts, accounting for an average invalidation rate of 82.9%.

This Article proceeds in four parts. Part I begins with a brief background on § 101 and non-practicing entities before discussing the *Alice v. CLS Banks* decision appearing before both the Federal Circuit and the U.S. Supreme Court. Part II lays out the patent landscape post-*Alice*, including the aftermath immediately post-*Alice*, the statistics at *Alice*'s one year anniversary, and then analysis and recommendations. Part III reviews how the Federal Circuit has applied *Alice* in 11 cases. Part IV concludes the Article.

I. The *Alice v. CLS Bank* Decision

A. Section 101 and Non-Practicing Entities

Section 101 of the Patent Act only examines patent eligibility, not patentability.⁷ The statute sets forth four categories of patent-eligible subject matter: "process, machine, manufacture, [and] composition of matter,"⁸ which essentially "include[s] anything under the sun that is made by man."⁹ However, § 101 has three common law exceptions: "laws of nature, physical phenomena, and abstract ideas."¹⁰ Courts have typically invalidated software patents as laws of nature or abstract ideas.¹¹

About 20 years ago, the Federal Circuit held that an algorithm implemented in a general-purpose computer is patentable.¹² This opened a floodgate for software patents, which attracted many non-practicing entities (NPE).¹³ Often

⁶Pursuant to the America Invents Act ("AIA"), the Board's name was changed from the Board of Patent Appeals and Interferences to the Patent Trial and Appeal Board. Leahy-Smith America Invents Act, Pub. L. No. 112-29 § 7(a)(1), 125 Stat. 284, 313 (2011). See generally *About PTAB*, USPTO, <http://www.uspto.gov/patents-application-process/patent-trial-and-appeal-board/resources/about-ptab> (last visited June 16, 2015).

⁷*CLS*, 717 F.3d at 1276. Other parts of the Patent Act address patentability, i.e., novelty in §102, non-obviousness in §103, written description, enablement and best mode in §112. See generally 35 U.S.C. §§ 102, 103, 112 (2012).

⁸35 U.S.C. § 101 (2012).

⁹*Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980). See generally § 2106 *Patent Subject Matter Eligibility* [R-9], USPTO, <http://www.uspto.gov/web/offices/pac/mpep/s2106.html> (last visited Sept. 28, 2013).

¹⁰*Bilski v. Kappos*, 130 S. Ct. 3218, 3225 (2010) (citing *Diamond*, 447 U.S. at 309); see also *Mayo Collaborative Serv. v. Prometheus Lab., Inc.*, 132 S. Ct. 1289, 1293 (2012). But see *Ulramercial, Inc. v. Hulu, LLC*, 722 F.3d 1335, 1342 (Fed. Cir. 2013) (stating that "[b]road inclusivity is the Congressional goal of § 101, not a flaw[.]" and arguing that the exceptions should rarely apply).

¹¹Since computers have advanced from merely implementing mathematical algorithms to incorporating their own concept into each invention, courts have shifted their view from characterizing software as laws of nature to analyzing them under abstract ideas. See Robert D. Swanson, *Section 101 and Computer-Implemented Inventions*, 16 STAN. TECH. L. REV. 161, 163 n.9 (2012).

¹²*In re Alappat*, 33 F.3d 1526 (Fed. Cir. 1994).

¹³Often referred to as "patent trolls." Daniel Nazer, *What's At Stake in CLS Bank—Do Software Patents Hold*

being vague and broad in nature, software patents give NPEs a powerful tool to threaten lawsuits and demand licensing fees.¹⁴ Although the trolls routinely do not make or sell products protected by their patents, they have successfully shaken down creators and brought about a “chilling” effect on innovation.¹⁵ Many people point to software patents as the root of the NPE problem,¹⁶ while others simply see software patents as “evil.”¹⁷ To get rid of NPEs, some advocate a ban on software patents altogether,¹⁸ or at least decrease of software patents’ term to five year.¹⁹ Moreover, while the U.S. Supreme Court has signaled a trend of tightening § 101 requirements, there has been a global movement of particularly scrutinizing software for patent eligibility and patentability.²⁰

B. *Alice* at the Federal Circuit²¹

After the Supreme Court passed down its *Mayo Collaborative Services v. Prometheus Laboratories, Inc.* decision on March 20, 2012,²² the Federal Circuit vacated its previous *CLS v. Alice* decision and reheard the case *en banc* on May 10, 2013.²³ Alice Corp.’s patents involved claims for business methods, data processing systems, and computer-readable media for reducing risk in a financial transaction.²⁴

The district court found the method, system and computer-readable medium claims at issue invalid under the “abstract idea” exception.²⁵ In the vacated Federal Circuit decision, the three-judge panel found Alice Corp.’s patents

Up The Sky?, ELECTRONIC FRONTIER FOUND. (May 15, 2013), <https://www.eff.org/deeplinks/2013/05/whats-stake-cls-bank-software-patents>. For a discussion on NPEs, see John M. Golden, Commentary, “Patent Trolls” and Patent Remedies, 85 TEX. L. REV. 2111 (2007).

¹⁴E.g., *id.*; Andrea Huspeni, *The Rising Threat of Patent Trolls and What You Can Do to Protect Your Startup*, ENTREPRENEUR, (Apr. 15, 2013), <http://www.entrepreneur.com/article/226367>.

¹⁵Nazer, *supra* note 13.

¹⁶See, e.g., *id.*

¹⁷See, e.g., Paul Graham, *Are Software Patents Evil?*, PAUL GRAHAM’S BLOG (Mar. 2006), <http://www.paulgraham.com/softwarepatents.html>.

¹⁸E.g., Ben Taylor, *It’s Time to Outlaw Software Patents*, AM. THINKER (Sept. 7, 2013), http://www.americanthinker.com/2013/09/its_time_to_outlaw_software_patents.html; Eva Arevuo, *Can The U.S. Follow New Zealand and Ban Software Patents?*, ENGINE.IS (Aug. 28, 2013), <http://engine.is/blog/posts/can-the-u-s-follow-new-zealand-and-ban-software-patents>.

¹⁹See Jeff Canter, *The First Step to Fighting Patent Trolls Is To Limit Software Patents to Five Years*, PANDODAILY (Aug. 13, 2013), <http://pandodaily.com/2013/08/13/the-first-step-to-fighting-patent-trolls-is-to-limit-software-patents-to-five-years/>.

²⁰See Masako Kikuchi, *Patent Eligibility and Patentability of Computer Software Patents in the United States, Europe and Japan*, CASRIP NEWSL. (Ctr. for Advanced Study & Research on Intellectual Prop., Washington, D.C.), 2009.

²¹717 F.3d 1269 (Fed. Cir. 2013).

²²132 S. Ct. 1289 (2012).

²³See *CLS Bank Int’l v. Alice Corp. Pty. Ltd.*, 685 F.3d 1341 (Fed. Cir. 2012), *reh’g en banc granted*, opinion vacated, 717 F.3d 1269 (Fed. Cir. 2013).

²⁴*CLS Bank Int’l v. Alice Corp. Pty. Ltd.*, 717 F.3d 1269, 1274 (Fed. Cir. 2013) (The invention is a “computerized trading platform used for conducting financial transactions in which a third party settles obligations between a first and a second party so as to eliminate ‘counterparty’ or ‘settlement’ risk.”). An invention can be claimed from three perspectives: claiming the system or device that implements computer instructions, claiming the computerized method, or claiming the computer-readable media containing those instructions. E.g., *CLS Bank Int’l v. Alice Corp. Pty. Ltd.: Poison Apple*, ADVANCED PAT. TRIAL STRATEGIES (Robins, Kaplan, Miller & Ciresi L.L.P., Minneapolis, M.N.), May 21, 2013, at 1.

²⁵*Id.* at 1275–76.

patent-eligible.²⁶ The Federal Circuit granted rehearing en banc to address two questions related to patent eligibility of computer-implemented inventions:²⁷

(1) What test should the court adopt to determine whether a computer-implemented invention is a patent ineligible “abstract idea”; and when, if ever, does the presence of a computer in a claim lend patent eligibility to an otherwise patent ineligible idea?

(2) In assessing patent eligibility under 35 U.S.C. § 101 of a computer-implemented invention, should it matter whether the invention is claimed as a method, system, or storage medium; and should such claims at times be considered equivalent for § 101 purposes?²⁸

However, instead of providing clear answers to these questions, ten Federal Circuit judges fractured and released six separate opinions with no majority.²⁹ The judges split 7-3 on the subject matter eligibility of the method and computer-readable medium claims with seven judges holding the claims were not patent-eligible, while the judges split evenly (5 to 5) on the system claims.³⁰ In fact, Chief Judge Rader admittedly asserted, “[n]othing said today beyond our judgment has the weight of precedent.”³¹

Although the *en banc* decision failed to establish a test for determining patent eligibility of software, the fractured court provided three potential frameworks to determine the subject matter eligibility of software: (1) Judge Lourie’s “strong” view, joined by Judges Dyk, Prost, Reyna and Wallach, asks whether a claim preempts an abstract idea; (2) Chief Judge Rader’s “moderate” view, joined by Judges Linn, Moore and O’Malley, asks whether a claim, as a whole, was limited to a particular application of an abstract idea; and (3) Judge Newman’s “weak” view, standing alone, argues for almost no scrutiny of patentable subject matter eligibility whatsoever.³²

1. Judge Lourie’s Strong View

Judge Lourie’s opinion set forth a two-pronged test: (1) separate the abstract idea from the remaining claims,³³ then (2) assess whether the claim preempts (i.e., add anything to) the abstract idea.³⁴ He suggested considering each claim

²⁶ See *CLS Bank Int’l v. Alice Corp. Pty. Ltd.*, 685 F.3d 1341 (Fed. Cir. 2012).

²⁷ In addition to the briefs addressing the two questions submitted by the main parties, 25 briefs were submitted on behalf of 47 amici. Petition for Writ of Certiorari, at *12, *CLS Bank Int’l v. Alice Corp. Pty. Ltd.*, 717 F.3d 1269 (Fed. Cir. 2013) (No. 13-298).

²⁸ *CLS Bank Int’l v. Alice Corp. Pty. Ltd.*, 1484 F. App’x 559, 559–60 (Fed. Cir. 2012).

²⁹ The *en banc* decision included a one-paragraph per curiam opinion, five concurring and dissenting opinions, and “additional reflections” by Chief Judge Rader. See *CLS Bank Int’l v. Alice Corp. Pty. Ltd.*, 717 F.3d 1269 (Fed. Cir. 2013).

³⁰ *Id.*

³¹ *Id.* at 1292, n.1 (Rader, C.J., concurring-in-part, dissenting-in-part).

³² E.g., Bernard Chao, *Interpreting CLS Bank Int’l v. Alice*, PATENTLYO (Sept. 03, 2013), available at <http://www.patentlyo.com/patent/2013/09/interpreting-cls-bank-intl-v-alice.html>. See generally *CLS*, 717 F.3d 1269.

³³ *CLS*, 717 F.3d at 1282 (Lourie, J., concurring) (“identify and define whatever fundamental concept appears wrapped up in the claim so that the subsequent analytical steps can proceed on a consistent footing”).

³⁴ *Id.* (“whether it contains additional substantive limitations that narrow, confine, or otherwise tie down the claim so that, in practical terms, it does not cover the full abstract idea itself.”). Judge Lourie further clarified that his “substantive claim limitations” are drawn from *Mayo*’s “inventive concept.” *Id.*

separately for patent eligibility, on a claim-to-claim basis.³⁵ In applying this approach to Alice Corp.'s method claims, Judge Lourie found the abstract idea as "reducing settlement risk by effecting trades through a third-party intermediary (here, the supervisory institution) empowered to verify that both parties can fulfill their obligations before allowing the exchange[,] *i.e.*, a form of escrow," then reviewed the remaining claim limitations one by one, and concluded that "none of [them] adds anything of substance to the claim."³⁶ Judge Lourie subjected the computer-readable medium claim to the same analysis because it was drawn "to the underlying method" in the process claims.³⁷ Since Judge Lourie viewed the system claims as "abstract methods coupled with computers adapted to perform those methods," he concluded that system claims were also indistinguishable from the method claims.³⁸ Accordingly, five judges found that all of Alice Corp.'s claims were ineligible for patenting.³⁹

2. Chief Judge Rader's Moderate View

Chief Judge Rader assessed the system claim as a whole to determine "whether a claim includes *meaningful* limitations restricting it to an application, rather than merely an abstract idea."⁴⁰ As applied to computer-implemented claims, his meaningful-limitation inquiry asks "whether the claims tie the otherwise abstract idea to a *specific way* of doing something with a computer, or a *specific computer* for doing something; if so, they likely will be patent eligible, unlike claims directed to *nothing more than the idea* of doing that thing on a computer."⁴¹

In reasoning that a computer including new software must be viewed as a new machine, Judge Rader and Moore held that the method and medium claims were not patent eligible, but the system claims were.⁴² In applying the methodology differently, Judge Linn and O'Malley found all the claims patent-eligible.⁴³

3. Judge Newman's Weak View

Although agreeing with Judge Lourie that all the claims stand or fall together, Judge Newman, standing alone, argued for no scrutiny of patentable subject

³⁵*Id.* at 1288.

³⁶*Id.* at 1286.

³⁷*Id.* at 1288 ("[the medium claims] are merely method claims in the guise of a device").

³⁸*Id.* at 1289–92 (discussing that although the system claims recited "physical objects," *i.e.*, computers, those objects were described "in generic, functional terms," as equipment capable of "carry[ing] out the otherwise abstract methods recited" in the method claims.)

³⁹*Id.* at 1292.

⁴⁰*Id.* at 1299 (Rader, C.J., concurring-in-part, dissenting-in-part). Judge Rader defines an abstract idea as "one that has no reference to material objects or specific examples—*i.e.*, it is not concrete." *Id.* A claim that "covers all practical applications of an abstract idea," or that "contains only insignificant or token pre- or post-solution activity" "is not meaningfully limited." *Id.* at 1300–01.

⁴¹*Id.* at 1302.

⁴²*Id.* at 1313.

⁴³*Id.* at 1321.

matter eligibility and evaluation of the CIIs only under patentability.⁴⁴ Consequently, she found all of Alice Corp.'s claims were patent eligible.⁴⁵

C. Alice at the U.S. Supreme Court⁴⁶

The U.S. Supreme Court applied the two-step test gleaned from *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*⁴⁷ to a claimed abstract idea. The claims at issue related to “a computerized scheme for mitigating... the risk that only one party to an agreed-upon financial exchange will satisfy its obligation” (“settlement risk”).⁴⁸

Applying the first step of the controlling test, the Court determined that the claims were “drawn to the abstract idea of intermediated settlement... *i.e.*, the use of a third party to mitigate settlement risk.”⁴⁹ The Court reasoned that this was a “fundamental economic practice long prevalent in our system of commerce” and could not be meaningfully distinguished from “the concept of risk hedging in *Bilski*.”⁵⁰

At the second step, the Supreme Court found that the claims did not involve sufficient “‘additional features’ to ensure ‘that the claim [was] more than a drafting effort designed to monopolize the [abstract idea].’”⁵¹ The Court first held that “[t]he introduction of a computer into the claims does not alter the analysis at *Mayo* step two.”⁵² As in *Gottschalk v. Benson*,⁵³ “the computer implementation did not supply the necessary inventive concept; the process could be ‘carried out in existing computers long in use.’”⁵⁴ The Supreme Court reasoned that “[s]tating an abstract idea while adding the words ‘apply it with a computer’ simply combines” the steps of “adding the words ‘apply it’” and “limiting the use of an abstract idea to a particular technological environment.”⁵⁵ This combination did not suffice to confer patent eligibility where neither step could independently, and could not “impart patent eligibility.”⁵⁶

Analyzing the claim elements separately, the Supreme Court explained that all of the computer functions were “purely conventional.”⁵⁷ Specifically, creating shadow records amounted to “electronic recordkeeping—one of the most basic functions of a computer”—and “us[ing] a computer to obtain data, adjust account balances, and issue automated instructions” were all “well-understood, routine, conventional activit[ies] previously known to the indus-

⁴⁴ *Id.* at 1326–27 (Newman, J., concurring-in-part, dissenting-in-part).

⁴⁵ *Id.* at 1327.

⁴⁶ 134 S. Ct. 2347.

⁴⁷ 132 S. Ct. 1289 (2012).

⁴⁸ *Alice*, 134 S. Ct. at 2352.

⁴⁹ *Id.* at 2355–56.

⁵⁰ *Id.* at 2357 (citing *Bilski v. Kappos*, 561 U.S. 593 (2010)).

⁵¹ *Id.* at 2357 (brackets in original) (quoting *Mayo*, 132 S. Ct. at 1297).

⁵² *Id.*

⁵³ 409 U.S. 63, 67 (1972).

⁵⁴ *Alice*, 134 S. Ct. at 2357.

⁵⁵ *Id.* at 2358 (internal citations and quotation marks omitted).

⁵⁶ *Id.*

⁵⁷ *Id.* at 2359 (quoting *Mayo*, 132 S. Ct. at 1298) (internal quotation marks and brackets omitted).

try.”⁵⁸ “In short, each step [did] no more than require a generic computer to perform generic computer functions.” Even considered “as an ordered combination,” the computer components “simply recit[ed] the concept of intermediated settlement as performed by a generic computer.”⁵⁹ The claims did “not, for example, purport to improve the functioning of the computer itself” or “effect an improvement in any other technology or technical field,” and instead amounted to “‘nothing significantly more’ than an instruction to apply the abstract idea of intermediated settlement using some unspecified, generic computer.”⁶⁰

Note that the Court treated method and system claims under the same analytical framework, explaining that “method claims recite the abstract idea implemented on a generic computer [while] the system claims recite a handful of generic computer components configured to implement the same idea.”⁶¹

II. The Software Patent Landscape Post-*Alice*

A. The Aftermath Immediately Post-*Alice*

On June 25, 2014, the PTO released a guidance memorandum to the Examining Corps, with instructions regarding how to implement *Alice*.⁶² Accordingly, the PTO would likely only allow software claims having limitations that are either “[i]mprovements to another technology or technical field; [i]mprovements to the functioning of the computer itself; [or m]eaningful limitations beyond generally linking the use of an abstract idea to a particular technological environment.”⁶³

As an “unwritten policy,” patent examiners currently view all claims reciting financial or business methods as presumably directed to abstract ideas.⁶⁴ categorizing any subject matter relating to banking, investments, or payment transactions as either a matter of “fundamental economic practices” or “methods of organizing human activities.”⁶⁵ A knowledgeable supervisory examiner opined that “it would be ‘very hard’ for applications related to financial subject matter to escape the designation of abstract ideas. The best hope for overcoming § 101 rejections appears to be demonstrating that the invention is ‘significantly more’ than the abstract idea itself.”⁶⁶

Between July 1 and August 15, 2014, patent applicants withdrew a total of

⁵⁸*Id.* (quoting *Mayo*, 132 S. Ct. at 1294).

⁵⁹*Id.* (quoting *Mayo*, 132 S. Ct. at 1298).

⁶⁰*Id.*

⁶¹*Id.* at 2360.

⁶²See Memorandum from Andrew H. Hirschfield, Deputy Comm’r of the U.S. Pat. & Trademark Off. to Patent Examiners (June 25, 2014) [hereinafter PTO’s Memorandum], available at <http://www.uspto.gov/sites/default/files/patents/announce/alice-pec-25jun2014.pdf>.

⁶³*Id.*

⁶⁴See Albert, *supra* note 5.

⁶⁵PTO’s Memorandum, *supra* note 62 (listing any subject matter relating to banking, investments, or payment transactions as leading examples of the several categories of abstract ideas).

⁶⁶Albert, *supra* note 5.

Figure 1. The courts' implementation of *Alice*

830 patent applications from the USPTO.⁶⁷ By December 15, 2014, *Alice* was cited in 32 district court decisions and 4 Federal Circuit opinions to invalidate patents under 35 U.S.C. § 101.⁶⁸ *Alice*'s effect in even just half a year was substantial: the number of newly filed patents cases dropped by 40% in 2014 as compared to 2013.⁶⁹

B. The Numbers at *Alice*'s Anniversary

As of June 19, 2015, *Alice* was cited in 198 PTAB decisions, 63 district court decisions, and 11 Federal Circuit opinions, in a total of 272 court cases, to invalidate patents under § 101, as shown in Table 1⁷⁰ and Figure 1.

The PTAB has upheld 18 patent applications and invalidated 178 patent applications—an invalidation rate of 90.8%. The district courts have upheld 40 patents and invalidated 92 patents—an invalidation rate of 69.7%. The Federal Circuit has upheld 1 patent and invalidated 16 patents—an invalidation rate of 94.1%. In total, 286 invalidations out of 345 patents or patent applications yields an average invalidation rate of 82.9% before the three courts.

⁶⁷ See *id.* at 3.

⁶⁸ See Jennifer A. Albert et al., *Impact of the Alice V. CLS Bank Decision – A Year-End Review*, GOODWIN PROCTER: IP ALERT (Dec. 19, 2014), <http://www.goodwinprocter.com/Publications/Newsletters/IP-Alert/2014/1219-Impact-of-the-Alice-V-CLS-Bank-Decision.aspx?article=1>.

⁶⁹ Austin Donohue, Patent Cases Down by 40% in 2014, BIOTECHNOW (Oct. 17, 2014), <http://www.biotech-now.org/public-policy/patently-biotech/2014/10/patent-cases-down-by-40-in-2014>.

⁷⁰ Case names, holdings, and reasoning were collected from Fenwick's website. Decoding Patent Eligibility Post-Alice: Patent Eligibility Case Analysis Tool, FENWICK & WEST LLP, <https://www.fenwick.com/pages/post-alice.aspx> (last visited June 12, 2015). Collected cases were read and reviewed in order to double-check Fenwick's data and to collect the relevant patent numbers or patent application numbers.

Holding	Reasoning	PTAB	DC	Federal Circuit	Total
Upheld	Not Abstract	9	10	1	21
	Significantly More than the Abstract Idea Itself	9	30	0	39
Total Upheld		18	40	1	59
Invalidated	Law of Nature/ Natural Phenomenon	2	3	4	9
	Abstract Idea: An Idea of Itself	0	2	1	3
	Abstract Idea: Certain Methods of Organizing Human Activities	8	10	2	20
	Abstract Idea: Fundamental Economic Practice	24	7	1	32
	Abstract Idea: Mathematical Relationships/ Formulas	5	0	1	6
	Abstract Idea: Mental Process	27	11	0	38
	Abstract Idea: Implemented on Generic Computer	110	59	7	176
Total Invalidated		178	92	16	286

Table 1: The statistics of the courts' implementation of *Alice* from June 19, 2014 to June 19, 2015.

C. Analysis and Recommendations

So far, the Federal Circuit has the highest invalidation rate at 94.1% with the PTAB not too far behind at 90.8%, whereas the district courts have the lowest invalidation rate of 69.7%. Thus, plaintiffs would be better off filing invalidation motions at the PTAB, whereas the defendant would want its patents to be challenged at the district courts. The PTAB seems to have been aggressively implementing *Alice*, being over-inclusive with abstract idea rejections and only cautiously allowing software claims.⁷¹ At this rate, the *Alice* scrutiny level seems comparable to the strict scrutiny standard of Constitutional law.⁷²

Because the sample size of the challenged patents or patent applications at the Federal Circuit is too small (n=15), the decisions may not be wholly indicative of the Federal Circuit's behavior and leaning. However, because the sample size of the challenged patents or patent applications at the PTAB is sufficient (n=165) to predict its behavior, defendants should avoid being challenged at the PTAB if at all possible.

As of 2004, the PTO had issued approximately 145,000 patents in 22 classes of "computer-implemented inventions."⁷³ There were roughly 1.5 million U.S. patents in force in 2004 and 2.5 million U.S. patents in force in 2015.⁷⁴ It may be

⁷¹ See also Albert, *supra* note 5 (arriving at the same conclusion).

⁷² Under the strict scrutiny standard, the government usually loses. See generally Adam Winkler, *Fatal in Theory and Strict in Fact: An Empirical Analysis of Strict Scrutiny in the Federal Courts*, 59 VAND. L. REV. 793 (2006). Similarly, under the *Alice*'s standard, the patent owner usually loses.

⁷³ Jorge Raúl Rodríguez Yañe, WIKIBOOK OF HEALTH INFORMATICS 452 (PediaPress 2006).

⁷⁴ See Dennis Crouch, The Number of U.S. Patents In Force, PatentlyO (Oct. 23, 2014), <http://patentlyo.com/>

estimated⁷⁵ that there are roughly 240,000 patents in force related to computer-implemented inventions as of 2015.⁷⁶ After applying the average invalidation rate of 82.9% at all three courts, without accounting for selection bias - that only weak software patents were taken to courts, roughly 199,000 current patents related to computer-implemented inventions would likely be found invalid if challenged, leaving about 41,000 valid patents related to computer-implemented inventions in force. If one accounts for the selection bias, the real number of invalid patents in force would likely be smaller.

Nevertheless, patents are presumed valid⁷⁷ until challenged and invalidated. Missouri Law Professor Dennis Crouch recommends “to leave those patents and their problematic claims on the patent rolls as if nothing had happened unless and until a third-party challenges their validity or the patentee abandons the protection.”⁷⁸ Thus, if a patent owner wants to enforce his software patent against alleged infringers, it is often better to accept a settlement rather than risk taking the patent to court where it may be invalidated.

Patent prosecutors could study the 79 challenged patents or patent applications that courts have upheld to learn how to draft meaningful claims that would likely avoid invalidation under *Alice*. Because these upheld patents or patent applications are likely useful and valuable, **Appendix A** lists the pertinent information of patents and patent applications upheld under *Alice* as of June 19, 2015.

III. Reviewing the 11 Federal Circuit Cases

A. Invalidated Decisions

In *WildTangent, Inc. v. Ultramercial, LLC*⁷⁹ (June 30, 2014), the U.S. Supreme Court granted certiorari, but, without discussion, vacated judgment and remanded the case to the Federal Circuit for further consideration in light of *Alice*.⁸⁰ In *Ultramercial, Inc. v. Hulu, LLC*,⁸¹ (Nov. 14, 2014), the Federal Circuit found that “the concept embodied by the majority of the [claim] limitations describes only the abstract idea of showing an advertisement before delivering free content.”⁸² The Court further found the additional claim limitations

patent/2014/10/number-patents-force.html.

⁷⁵Estimated performed because there is presently no official number of software patents currently in force as of 2015.

⁷⁶This number was arrived at by multiplying 145,000 patents related to “computer-implemented inventions” with the growth rate of 167% (2.5 million patents in force as of 2014 divided by 1.5 million patents in force as of 2004). Note that this is rather an underestimate given an increasing trend of software patents just before mid-2014 when the Supreme Court decided *Alice*.

⁷⁷35 U.S.C. § 282 (2012). The Patent Act of 1952, Pub. L. No. 82-593, ch. 950, 66 Stat. 792, 812, codified the presumption of validity.

⁷⁸Dennis Crouch, *What to do About All These Invalid Patents?*, PATENTLYO (Aug. 28, 2014), <http://patentlyo.com/patent/2014/08/these-invalid-patents.html>.

⁷⁹134 S. Ct. 2870 (2014).

⁸⁰*Id.* at 2870.

⁸¹772 F.3d 709 (Fed. Cir. 2014).

⁸²*Id.* at 715.

(e.g., “consulting an activity log, add a degree of particularity”⁸³) “do not transform the abstract idea... into patent-eligible subject matter because the claims simply instruct the practitioner to implement the abstract idea with routine, conventional activity.”⁸⁴

In *Digitech Image Technologies, LLC v. Electronics for Imaging, Inc.*⁸⁵ (July 11, 2014), the challenged method claims recite “a process of taking two data sets and combining them into a single data set, the device profile.”⁸⁶ Because the two data sets are “generated by taking existing information... and organizing this information into a new form,”⁸⁷ the Federal Circuit found the claims directed to “an ineligible abstract process of gathering and combining data that does not require input from a physical device.”⁸⁸

In *Planet Bingo, LLC v. VKGS LLC*⁸⁹ (Aug. 26, 2014), the Federal Circuit characterized the claimed invention as “managing a bingo game while allowing a player to repeatedly play the same sets of numbers in multiple sessions.”⁹⁰ Because “managing the game of bingo consists solely of mental steps which can be carried out by a human using pen and paper”⁹¹ and “the claims recite a generic computer implementation of the covered abstract idea,”⁹² the Federal Circuit found the challenged claims invalid under *Alice*.⁹³

In *buySAFE, Inc. v. Google, Inc.*⁹⁴ (Sept. 3, 2014), the Federal Circuit found that “[t]he claims are squarely about creating a contractual relationship—a ‘transaction performance guaranty’ — that is beyond question of ancient lineage.”⁹⁵ The Court found the claims invalid as directed to an abstract idea⁹⁶ because they “do not push or even test the boundaries of the Supreme Court precedents under section 101.”⁹⁷

In *re BRCA1- and BRCA2-Based Hereditary Cancer Test Patent Litigation*⁹⁸ (Dec. 17, 2014), the challenged claims “describe the comparison of wild-type genetic sequences with the subject’s genetic sequence” by “hybridizing a BRCA gene probe and []detecting the presence of a hybridization product,” and “describe the techniques to be used in making the comparisons” by “require[ing] amplification of the BRCA1 gene and []sequencing of the amplified nucleic acids.”⁹⁹ The Federal Circuit held that the “non-patent-ineligible elements... do not add ‘enough’ to make the claims as a whole patent-eligible,”¹⁰⁰ thus, invalidated

⁸³ *Id.*

⁸⁴ *Id.*

⁸⁵ 758 F.3d 1344 (Fed. Cir. 2014).

⁸⁶ *Id.* at 1351.

⁸⁷ *Id.*

⁸⁸ *Id.*

⁸⁹ 576 F. App’x. 1005 (Fed. Cir. 2014).

⁹⁰ *Id.* at 1007.

⁹¹ *Id.* (internal quotation marks omitted).

⁹² *Id.* at 1008.

⁹³ *Id.* at 1009.

⁹⁴ 765 F.3d 1350 (Fed. Cir. 2014).

⁹⁵ *Id.* at 1355.

⁹⁶ *Id.* at 1355.

⁹⁷ *Id.* at 1355–56.

⁹⁸ 774 F.3d 755 (Fed. Cir. 2014).

⁹⁹ *Id.* at 763–64.

¹⁰⁰ *Id.* at 764.

the patent as law of nature or natural phenomenon.¹⁰¹

In *Content Extraction and Transmission LLC v. Wells Fargo Bank, National Association*¹⁰² (Dec. 23, 2014), the Federal Circuit found “asserted patents are drawn to the abstract idea of 1) collecting data, 2) recognizing certain data within the collected data set, and 3) storing that recognized data in a memory.”¹⁰³ Because “[t]he concept of data collection, recognition, and storage is undisputedly well-known,”¹⁰⁴ the Court found the claims invalid as directed to an abstract idea.¹⁰⁵

In *AllVoice Developments US, LLC, v. Microsoft Corp.*¹⁰⁶ (May 22, 2015), the Federal Circuit found that the challenged claims of “‘interface applications’... not directed to a tangible article and are not process claims,” thus, not patent eligible and invalid as an abstract idea when implemented on a computer.¹⁰⁷

In *OIP Technologies, Inc., v. Amazon, Inc.*¹⁰⁸ (June 11, 2015), the challenged patent recites a price-optimization method that “helps vendors automatically reach better pricing decisions through automatic estimation and measurement of actual demand to select prices.”¹⁰⁹ The Federal Circuit invalidated the patent, finding such “patent claims the abstract idea of offer-based price optimization and lacks an ‘inventive concept’ sufficient to ‘transform’ the claimed subject matter into a patent-eligible application of that idea.”¹¹⁰

In *Ariosa Diagnostics, Inc., v. Sequenom, Inc.*¹¹¹ (June 12, 2015), the challenged patent claims certain methods of using cell-free fetal DNA (“cffDNA”), such as “amplifying the cffDNA contained in a sample of a plasma or serum from a pregnant female and detecting the paternally inherited cffDNA” and “making a diagnosis of certain fetal characteristics based on the detection of paternally inherited cffDNA.”¹¹² The Federal Circuit invalidated this patent as patent-ineligible laws of nature and natural phenomenon because although “detecting cffDNA in maternal plasma or serum that before was discarded as waste material is a positive and valuable contribution to science, . . . such valuable contributions can fall short of statutory patentable subject matter.”¹¹³

B. The Only Upheld Decision

As of June 19, 2015, the Federal Circuit has only issued one opinion that upheld the patent-eligibility of a software invention under *Alice*. In *DDR Holdings, LLC v. Hotels.com, L.P.*,¹¹⁴ (Dec. 5, 2014), the challenged e-commerce patent cov-

¹⁰¹ *Id.* at 765.

¹⁰² 776 F.3d 1343 (Fed. Cir. 2014).

¹⁰³ *Id.* at 1347.

¹⁰⁴ *Id.*

¹⁰⁵ *Id.* at 1351.

¹⁰⁶ —F. App'x.—, No. 2014–1258, 2015 WL 2445055 (Fed. Cir. May 22, 2015).

¹⁰⁷ *Id.* at *8.

¹⁰⁸ 788 F.3d 1359 (Fed. Cir. 2015).

¹⁰⁹ *Id.* at 1361.

¹¹⁰ *Id.* at 1364.

¹¹¹ 788 F.3d 1371 (Fed. Cir. 2015).

¹¹² *Id.* at 1373.

¹¹³ *Id.* at 1380.

¹¹⁴ 773 F.3d 1245 (Fed. Cir. 2014).

ers “systems and methods of generating a composite web page that combines certain visual elements of a ‘host’ website with content of a third-party merchant.”¹¹⁵ Notwithstanding Judge Mayer’s strong dissenting opinion,¹¹⁶ the majority recognized that the challenged claims “do not merely recite the performance of some business practice known from the pre-Internet world along with the requirement to perform it on the Internet” but are “necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks.”¹¹⁷ To reach its conclusion of patentable subject matter, the majority contrasted the challenged claims with those found to be patent-ineligible in *Alice*, *Ultramercial*,¹¹⁸ *buySAFE*,¹¹⁹ *Accenture Global Services, GmbH v. Guidewire Software, Inc.*,¹²⁰ and *Bancorp Services, L.L.C. v. Sun Life Assurance Company of Canada (U.S.)*.¹²¹

IV. Conclusion

Following *Alice*, 830 patent applications were withdrawn from the USPTO between July 1 and August 15, 2014. One year since its issuance, the *Alice* decision has been applied by the PTAB, district courts, and the Federal Circuit alike to invalidate or reject software-based patent claims resulting in a total of 286 invalidations out of 345 patents or patent applications. With few decisions upholding patent-eligibility, the post-*Alice* trend has been overwhelmingly against software-based patent claims with an average invalidation rate of 81.7%. This Article estimates that – without accounting for selection bias – out of roughly 240,000 patents in force related to computer-implemented inventions as of 2015, roughly 199,000 of those are likely invalid, leaving about 41,000 valid patents.

¹¹⁵*Id.* at 1248.

¹¹⁶*Id.* at 1263–66 (Mayer, J., dissenting) (characterizing DDR’s patents as describing the entrepreneurial goal “that an online merchant’s sales can be increased if two web pages have the same ‘look and feel,’” where the “store within a store” concept is rather well-known).

¹¹⁷*Id.* at 1257.

¹¹⁸772 F.3d 709 (Fed. Cir. 2014).

¹¹⁹765 F.3d 1350 (Fed. Cir. 2014).

¹²⁰728 F.3d 1336 (Fed. Cir. 2013) (deciding the challenged claim of “a system for generating tasks to be performed in an insurance organization”), *cert. denied*, 134 S. Ct. 2871 (2014).

¹²¹687 F.3d 1266 (Fed. Cir. 2012) (deciding the challenged claim of “[a] method for managing a life insurance policy”).

Appendix A

Appendix A documents the 79 patents or patent applications upheld under *Alice* as of June 19, 2015.

Patent No. or Patent App. No.	Cases	Court	Holding	Reasoning
8,311,945 B2	U.S. Bancorp, v. Solutran, Inc.(Inst. Decision) CBM2014-00076 Date: August 7, 2014	PTAB	upheld	Not Abstract
7,035,914 B1	Google Inc., v. Simpleair, Inc. (Denying Inst. Decision) CBM2014-00170 Date: February 9, 2015	PTAB	upheld	Not Abstract
5,940,510	JP Morgan Chase & Co., JP Morgan Chase Bank, N.A., v. Maxim Integrated Products, Inc. (Inst. Decision) CBM2014-00179 Date: February 20, 2015	PTAB	upheld	Not Abstract
11/541,430	Ex Parte Steve Bush, Edward Jung, Holly Knight (Decision on Appeal) 2013-001110 Date: February 27, 2015	PTAB	upheld	Not Abstract
12/427,040	Ex Parte Renald Poisson (Decision on Appeal) 2012-011084 Date: February 27, 2015	PTAB	upheld	Not Abstract
11/612,975	Ex Parte Sandra L. Kogan, Eric M. Wilcox, Charles R. Hill (Decision on Appeal) 2012-007800 Date: March 4, 2015	PTAB	upheld	Not Abstract
12/082,498	Ex Parte Michael Emmendorfer, Tom Cloonan, Erich Arnold (Decision on Appeal) 2012-010753 Date: March 5, 2015	PTAB	upheld	Not Abstract
12/023,728	Ex Parte Martin A. Urban (Decision on Appeal) 2012-005678 Date: April 3, 2015	PTAB	upheld	Not Abstract

Patent No. or Patent App. No.	Cases	Court	Holding	Reasoning
12/287,686	Ex Parte Roderick A. Hyde, Muriel Y. Ishikawa, Eric C. Leuthardt, Royce A. Levien, Robert W. Lord, Mark A. Malamud, Elizabeth A. Sweeney, Lowell L. Wood, Jr., Victoria Y.H. Wood (Decision on Appeal) 2012-009103 Date: April 29, 2015	PTAB	upheld	Not Abstract
7,818,399	DDR Holdings, LLC, v. Hotels.com et al. (Opinion and Judgment) 2013-1505 Date: December 5, 2014	Fed. Cir.	upheld	Not Abstract
7,894,929	Autoform Engineering GMBH, v. Engineering Technology Associates, Inc. (Order Denying Defendant's Motion for Summary Judgment and Denying Plaintiff's Motion for Summary Judgment) MIED-2-10-cv-14141 Date: September 5, 2014	DC	upheld	Not Abstract
6,772,132 and 6,766,304	Trading Technologies International, Inc., v. CQG, Inc., CQGT, LLC (Memorandum Opinion and Order) ILND-05-cv-4811 Date: February 24, 2015	DC	upheld	Not Abstract
6,504,886 and 6,332,009 and 6,570,932 and 6,163,570 and 7,062,022 and 5,970,100	Modern Telecom Systems LLC., v. Juno Online Services, Inc., et al. (Order) CACD-8-14-cv-00348 Date: March 17, 2015	DC	upheld	Not Abstract
5,987,610	Intellectual Ventures I LLC, v. Symantec Corp. (Memorandum Opinion) DED-1-10-cv-01067 Date: April 22, 2015	DC	upheld	Not Abstract
7,631,191 B2	PNC Bank, National Association, U.S. Bank, National Association, and U.S. Bancorp, v. Secure Axxess, LLC (Inst. Decision) CBM2014-00100	PTAB	upheld	Significantly More than the Abstract Idea Itself

Patent No. or Patent App. No.	Cases	Court	Holding	Reasoning
	Date: September 9, 2014			
11/782,381	Ex Parte Larry J. Kane (Decision on Appeal) 2012-000901 Date: October 8, 2014	PTAB	upheld	Significantly More than the Abstract Idea Itself
10/554,334	Ex Barry Jay Weber, Ion Vizireanu, Patrick John Shevlin, Ahamad Ouri (Decision on Appeal) 2012-003904 Date: October 8, 2014	PTAB	upheld	Significantly More than the Abstract Idea Itself
11/820,364	Ex Parte William Schmid, Arete Marha Passas (Decision on Appeal) 2012-002155 Date: December 23, 2014	PTAB	upheld	Significantly More than the Abstract Idea Itself
12/506,666	Ex Parte David M. Jimick (Decision on Appeal) 2012-009601 Date: January 29, 2015	PTAB	upheld	Significantly More than the Abstract Idea Itself
11/707,554	Ex Parte Edward L. Palmer (Decision on Appeal) 2012-003262 Date: February 26, 2015	PTAB	upheld	Significantly More than the Abstract Idea Itself
12/242,396	Ex Parte Steven J. Scott, Thong T. Nguyen, Gregory Cieslak, Thomas Llyod Heidebrecht, Pete J. Klein, Gary Dan Dotson (Decision on Appeal) 2012-009834 Date: March 10, 2015	PTAB	upheld	Significantly More than the Abstract Idea Itself
6,950,807 B2	Westlake Services, LLC, Westlake Financial Services, LLC, v. Credit Acceptance Corp. (Inst. Decision) CBM2014-00008 Date: March 31, 2015	PTAB	upheld	Significantly More than the Abstract Idea Itself
12/033,611	Ex Parte Dietra A Kuester, Eric J. Kuester (Decision on Appeal) 2013-001127 Date: May 6, 2015	PTAB	upheld	Significantly More than the Abstract Idea Itself

Patent No. or Patent App. No.	Cases	Court	Holding	Reasoning
6,978,304 and 7,634,571	Helios Software, LLC , Pearl Software, Inc., v. Spectorsoft Corporation (Memorandum Opinion) DED-1-12-cv-00081 Date: September 18, 2014	DC	upheld	Significantly More than the Abstract Idea Itself
5,826,245	Card Verification Solutions, LLC , v. Citigroup Inc. (Memorandum Opinion and Order) ILND-1-13-cv-06339 Date: September 29, 2014	DC	upheld	Significantly More than the Abstract Idea Itself
7,116,710 and 7,421,032 and 7,916,781 and 8,284,833	The California Institute of Technology, v. Hughes Communications Inc., Hughes Network Systems LLC , Dish Network Corporation, Dish Network LLC , Dishnet Satellite Broadband LLC (Order Denying Motion for Summary Judgment) CACD-2-13-cv-07245 Date: November 3, 2014	DC	upheld	Significantly More than the Abstract Idea Itself
7,664,701 and 8,083, 137 and 7,603,382 and 7,260,587 and 6,182,894	Intellectual Ventures I LLC, Intellectual Ventures II LLC, v. Manufacturers and Traders Trust Company (Memorandum Opinion) DED-1-13-cv-01274 Date: December 18, 2014	DC	upheld	Significantly More than the Abstract Idea Itself
7,124,028 and 7,983,847 and 8,296,068 and 8,644,111	Fairfield Industries, Inc., v. Wireless Seismic, Inc. (Memorandum and Order) TXSD-4-14-cv-02972 Date: December 23, 2014	DC	upheld	Significantly More than the Abstract Idea Itself
7,334,720 and 7,942,317 and 8,033,458 and 8,061,598 and 8,118,221 and 8,336,772	Smartflash LLC, v. Apple, Inc. (Report and Recommendation) TXED-6-13-cv-00447 Date: January 21, 2015	DC	upheld	Significantly More than the Abstract Idea Itself
7,585,680	Ameritrox, LTD, Marshfield Clinic, Inc., v. Millennium Health, LLC (Opinion and Order) WIWD-3-13-cv-00832 Date: February 18, 2015	DC	upheld	Significantly More than the Abstract Idea Itself

Patent No. or Patent App. No.	Cases	Court	Holding	Reasoning
7,409,450 and 6,557,054	Intellectual Ventures I LLC, Intellectual Ventures II LLC, v. Motorola Mobility LLC (Memorandum Opinion) DED-1-11-cv-00908	DC	upheld	Significantly More than the Abstract Idea Itself
5,446,747	France Telecom S.A., v. Marvell Semiconductor Inc. (Order) CAND-3-12-cv-04967 Date: March 2, 2015	DC	upheld	Significantly More than the Abstract Idea Itself
8,750,183	Messaging Gateway Solutions, LLC, v. Amdocs, Inc., Amdocs Limited (Memorandum Opinion) DED-1-14-cv-00732 Date: April 15, 2015	DC	upheld	Significantly More than the Abstract Idea Itself
5,999,939 and 6,996,561 and 7,958,059	Kenexa BrassRing, Inc., v. HireAbility.com, LLC (Memorandum Opinion) MAD-1-12-cv-10943 Date: April 28, 2015	DC	upheld	Significantly More than the Abstract Idea Itself