BETWEEN SCYLLA AND CHARYBDIS: ADDRESSING SOFTWARE PATENT ELIGIBILITY IN EARLY-STAGE LITIGATION

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The U.S. Supreme Court's decision in Alice Corp. v. CLS Bank International *established a two-step inquiry for determining the eligibility of a patent claim for protection. The test has faced criticism for its inconsistency, particularly when evaluating software-related patents. These inconsistencies are exacerbated when the test is applied during the early stages of litigation to address motions made under Federal Rules of Civil Procedure 12(b)(6) and 12(c), as the test often requires an in-depth technical analysis of the claims.*

First, this Note examines the current approach to software patent eligibility and the various points of inconsistencies and tension. This Note then argues that incorporating claim construction—the process of interpreting patent claims from the perspective of someone skilled in the relevant field—into the pleadings stage can help litigants identify factual disputes and avoid making premature technical decisions.

INTRODUCTION

On New Year's Eve 2013, Michael Skelps, the owner of a photography business, received an unexpected email from a lawyer accusing him of patent infringement.[1] The lawsuit alleged that Skelps's photography website, which he described as "hardly rocket-science,"[2] had intentionally infringed upon a few vague patents owned by someone named Peter Wolf.[3] Despite the seemingly mundane nature of his business, Skelps found himself at the center

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1. Michael Skelps, *Supreme Court's* Alice *Decision Protected My Small Businesses from Patent Trolls*, THE HILL (July 7, 2016, 9:44 AM), https://thehill.com/homenews/286691-supreme-courts-alice-decision-protected-my-small-businesses-from-patent-trolls/ [https://perma.cc/AZT7-2A82].

2. *Id.*

3. *Small Business Fights for Its Life, Wins with* Alice, ELECTRONIC FRONTIER FOUNDATION (June 22, 2017), https://www.eff.org/alice/small-business-fights-its-life-wins-alice [https://perma.cc/5EDW-MYD7].

of a patent infringement case that lasted ten months, cost him $100,000, forced him to lay off 60 percent of his workforce, and left him facing the possibility of losing his home.[4]

However, the U.S. Supreme Court's decision in *Alice Corp. v. CLS Bank International*[5] in the summer of 2014 helped to curb excessively broad and vague patents like Wolf's.[6] Because Skelps's litigation was still in the early stages, he filed a motion for judgment on the pleadings under Federal Rule of Civil Procedure 12(c)[7], essentially asking the court to invalidate the plaintiff's overbroad patents at the outset of the case and save him from potentially devastating litigation costs.[8] In October 2014, Judge Christina A. Snyder of the U.S. District Court for the Central District of California sided with Skelps, invalidating the plaintiff's patents as claiming ineligible subject matter.[9]

The Supreme Court's ruling in *Alice* has had a significant impact on the patent landscape, particularly impacting the determination of abstractness in software-related patents.[10] The availability of early resolution tools, such as Rule 12(c) motions for judgment on the pleadings, have been invaluable for defendants like Skelps, allowing them to avoid costly and time-consuming litigation.[11] However, the application of the *Alice* test has proven challenging in practice, resulting in ongoing debate and confusion among practitioners.[12]

The origins of the *Alice* decision can be traced back to early patent case law and the belief that fundamental ideas should be "free to all" and "reserved exclusively to none."[13] Without access to the basic principles underlying science and nature, it is difficult for people to create new, potentially transformative inventions.[14] Although Congress intended that patents should be granted for "anything under the sun that is made by man,"[15] this concern about preemption led to the creation of a rule stating that "abstract ideas" are not eligible for patent protection.[16]

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4. *See* Skelps, *supra* note 1.

5. 573 U.S. 208 (2014).

6. *Id.* at 217–18.

7. FED. R. CIV. P. 12(c).

8. *See* Wolf v. Capstone Photography, Inc., No. 13-CV-09573, 2014 WL 7639820 (C.D. Cal. Oct. 28, 2014).

9. *See id.* at *7–15.

10. *See infra* Part II.

11. *See Small Business Fights for Its Life, Wins with* Alice, *supra* note 3; Ultramercial, Inc. v. Hulu, LLC, 772 F.3d 709, 718 (Fed. Cir. 2014) (Mayer, J., concurring); Christopher J. Ryan, Jr. & Brian L. Frye, *Patents & Legal Expenditures*, 51 U. PAC. L. REV 577, 585 (2020) (discussing the high costs associated with patent litigation).

12. *See infra* Part II.

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

14. *See* Le Roy v. Tatham, 55 U.S. 156, 175 (1852) ("A patent is not good for an effect . . . that would prohibit all other persons from making the same thing by any means whatsoever. This, by creating monopolies, would discourage arts and manufactures, against the avowed policy of the patent laws.").

15. Diamond v. Diehr, 450 U.S. 175, 182 (1981) (quoting S. REP. NO. 1979, at 5 (1952); H.R. REP. NO. 1923, at 6 (1952)).

16. *See* Mayo Collaborative Servs. v. Prometheus Lab'ys, Inc., 566 U.S. 66, 70 (2012).

Despite efforts to clearly define abstract ideas, a concrete definition has yet to be established.[17]   As a result, courts have used various tests to determine whether a patent claim is directed to an abstract idea.[18]   The prevailing test for determining abstractness today is the two-step inquiry outlined in *Alice*, which asks (1) whether the claim is directed to an abstract idea, and if so, (2) whether it includes an "inventive concept" that makes it eligible for patent protection.[19]   Although this test was designed to align with the original goal of preventing the monopolization of fundamental principles,[20] it has been criticized for being impractical, unpredictable, and inconsistent, particularly when applied to software-related patents.[21]

The emergence of software, which is intangible by nature, posed a unique challenge for the patent system, generating significant scholarship addressing whether software should be eligible for patent protection at all.[22]   Today, software is generally recognized as patent-eligible, but the challenge lies in identifying the underlying abstract idea and finding the inventive concept.[23]   Striking the right balance between expanding and restricting the standards for software patents has proven to be a difficult task, described by Justice Stephen G. Breyer as a choice "between Scylla and Charybdis."[24]

This Note aims to address the issue of how the current process used by courts to determine the eligibility of software-related patents during the early stages of litigation can be improved to increase predictability, reliability, and consistency. To explore this question, this Note proceeds in three parts.

First, Part I offers an overview of key technical and procedural concepts and explores the complex evolution of jurisprudence surrounding software patent eligibility. Next, Part II examines the current approach to patent eligibility and the emergence of so-called shadow tests. Part II also discusses the procedural and substantive points of tension that arise when applying the eligibility test.   Finally, Part III proposes a resolution, arguing for incorporating a form of claim construction into the early stages of litigation.

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17. *See* Hung H. Bui, *A Common Sense Approach to Implement the Supreme Court's* Alice *Two-Step Framework to Provide "Certainty" and "Predictability*,*"* 100 J. Pat. & Trademark Off. Soc'y 165, 233 (2018).

18. *Id.*

19. *See* Alice Corp. v. CLS Bank Int'l, 573 U.S. 208, 217–18 (2014).

20. *See id.*

21. *See, e.g.*, *The State of Patent Eligibility in America, Part I: Hearing Before the Subcomm. on Intell. Prop. of the S. Comm on the Judiciary*, 116th Cong. 2 (2019) (statement of Judge Paul R. Michel (Ret.) of the U.S. Court of Appeals for the Federal Circuit) ("[R]ecent changes to patent case law have produced . . . [u]ncertainty, unpredictability, inconsistent results and undue and harmful exclusions of new technologies . . . ."); Kristen Osenga, *Institutional Design for Innovation: A Radical Proposal for Addressing § 101 Patent-Eligible Subject Matter*, 68 Am. U. L. Rev. 1191, 1203–04 (2019).

22. The broader theoretical debate over software patents is outside the scope of this Note. For a source discussing this debate, see, for example, Martin Campbell-Kelly, *Not All Bad: An Historical Perspective on Software Patents*, 11 Mich. Telecomm. & Tech. L. Rev. 191 (2005).

23. *See infra* Part II.

24. Transcript of Oral Argument at 17, Alice Corp. v. CLS Bank Int'l, 573 U.S. 208 (2014) (No. 13-298). Choosing between Scylla and Charybdis comes from Greek mythology and essentially means to choose between the lesser of two evils.

I. SOFTWARE, PATENTS, AND THE HISTORY OF ELIGIBILITY

This part explains key technical concepts and discusses the broader historical treatment of software-related patents. Part I.A discusses a brief overview of patent law in the United States, including requirements for obtaining, enforcing, and defending a patent. Part I.B describes aspects of software that are relevant to patent eligibility. Part I.C provides a survey of the history of patent eligibility with a focus on the abstract-ideas exception and software-related patents.

A. Patent 101

The basis for patent law can be traced back to the U.S. Constitution, which grants Congress the power to "promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."[25] A patent is a form of intellectual property that gives the holder "the right to exclude others from making, using, offering for sale, or selling the invention."[26] This grant of exclusivity is intended to serve as an incentive for innovation by granting a limited-term monopoly in exchange for disclosing how the invention works to the public.[27] By providing both protection for the inventor and access to new knowledge for the public, the patent system aims to foster a balance between promoting innovation and promoting the dissemination of information for the benefit of society.[28]

1. Patent Requirements

For an invention to be eligible for a patent, it must meet certain eligibility and validity requirements outlined in Title 35 of the U.S. Code, known as the Patent Act.[29] These requirements mandate that the invention be subject matter eligible, useful,[30] novel,[31] nonobvious,[32] and definite.[33]

The first two requirements—subject matter eligibility and usefulness—are outlined in 35 U.S.C. § 101, which states that a utility patent[34] may be granted to anyone who invents a "new and useful process, machine, manufacture, or composition of matter . . . [or] any new and useful improvement."[35] This section sets forth the requirement that an invention must fall into one of the statutory categories of process, machine,

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25. U.S. CONST. art. I, § 8, cl. 8.
26. 35 U.S.C. § 154(a)(1). The statutory term for patent protection lasts for twenty years from the application filing date. *Id.* § 154(a)(2).
27. *Id.* § 154(a)(1); *id.* § 112.
28. *Id.* § 154(a)(1); *id.* § 112.
29. 35 U.S.C. §§ 1–390.
30. *Id.* § 101.
31. *Id.* § 102.
32. *Id.* § 103.
33. *Id.* § 112.
34. There are three types of patents: design, plant, and utility. *See id.* §§ 101, 161, 171. Design and plant patents are outside the scope of this Note.
35. *Id.* § 101.

manufacture, or composition of matter.[36] Additionally, the Supreme Court has held that § 101 includes an implicit exception for abstract ideas, laws of nature, and natural phenomena, which are not eligible for patent protection.[37]

The novelty requirement, outlined in § 102, stipulates that the invention must be new and must not have been previously patented or publicly disclosed.[38] The nonobviousness requirement, defined in § 103, requires that the invention must not be obvious to a person skilled in the relevant field.[39] Finally, to be definite under § 112, the patent must include a specification that provides sufficient detail to allow someone skilled in the relevant field to "make and use" the invention.[40]

A patent document must include at least one claim,[41] which defines the boundaries of the invention, and a specification, which discloses how the invention was created.[42] The claims and specification are crucial for evaluating a patent, as they define the scope of the property rights and reveal the underlying principles of the invention.[43]

Patent applications are submitted to and examined by the United States Patent and Trademark Office[44] (USPTO). If a patent application is denied, the applicant may appeal the decision to the Patent Trial and Appeal Board (PTAB) and subsequently to the U.S. Court of Appeals for the Federal Circuit.[45]

2. Patent Infringement, Defenses, and the Presumption of Validity

As the Patent Act is a federal statute, patent-related disputes such as infringement lawsuits fall under federal jurisdiction.[46] Therefore, patent infringement cases can be brought before district courts and appealed to the Federal Circuit.[47]

In a patent infringement lawsuit, there are two primary considerations: the scope of the patent's coverage and whether the defendant's product has

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36. *Id.*

37. *See* Mayo Collaborative Servs. v. Prometheus Lab'ys, Inc., 566 U.S. 66, 70 (2012). Despite these requirements, Congress intended for eligible subject matter to be broadly interpreted. *See* Diamond v. Diehr, 450 U.S. 175, 182 (1981).

38. 35 U.S.C. § 102.

39. *Id.* § 103.

40. *Id.* § 112(a).

41. *See* 1 R. CARL MOY, MOY'S WALKER ON PATENTS § 4:1 (4th ed. 2020).

42. *See id.*

43. *See id.*

44. *See Patent Process Overview*, U.S. PAT. & TRADEMARK OFF., https://www.uspto.gov/patents/basics/patent-process-overview [https://perma.cc/TM7T-36A9] (last visited Sept. 3, 2023).

45. *See* 35 U.S.C. §§ 134(a), 141(a). The U.S. Court of Appeals for the Federal Circuit was established in 1982 after the passage of the Federal Courts Improvement Act of 1982. Pub. L. No. 97-164, 96 Stat. 25 (codified as amended in scattered sections of the U.S.C.). The Act abolished the Court of Customs and Patent Appeals, and the Federal Circuit assumed jurisdiction over all patent appeals. *See id.*

46. *See* 28 U.S.C. § 1400(b).

47. *Id.*; 35 U.S.C. § 141(a).

infringed upon that scope.[48] If a defendant is sued for infringement, one defense they may raise is that the plaintiff's patent is invalid due to ineligible subject matter.[49]

Under § 282 of the Patent Act, all issued patents are presumed to be valid.[50] As a result, the burden of proving the invalidity of a patent or any of its claims falls on the defendant,[51] which must be done by presenting "clear and convincing evidence."[52] This high standard for challenging validity is applied to challenges based on novelty, nonobviousness, and definiteness.[53] However, the application of the "clear and convincing evidence" standard to § 101 subject matter eligibility challenges is less clear.[54]

3. Claim Construction & *Markman* Hearings

The claims of a patent define the scope of the patent's protection.[55] However, understanding the boundaries of an intangible property right, particularly in a technical field like software that is characteristically abstract, can be a challenging task.[56] To bring further clarity to this process, courts have adopted the practice of claim construction, in which they interpret the claims of a patent by determining the meaning that the language "would be given by persons experienced in the field of the invention."[57]

Claim construction can be carried out in a few different ways. A court may interpret patent claims based on a paper record, hold a formal claim construction hearing before trial, or issue a claim construction order after trial and before jury instructions.[58] Although the Federal Rules of Civil Procedure do not require a formal claim construction hearing, the Supreme Court's

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48. *See* Markman v. Westview Instruments, Inc., 517 U.S. 370, 384 (1996).

49. *See* 35 U.S.C. § 282. The defendant can also challenge validity on the grounds that the patent is not novel, not nonobvious, or indefinite. *Id.*

50*. Id.*

51. *Id.*

52*. See* Microsoft Corp. v. i4i Ltd. P'ship, 564 U.S. 91, 95 (2011).

53*. See* Kristen Dietly, *Lightening the Load: Whether the Burden of Proof for Overcoming a Patent's Presumption of Validity Should Be Lowered*, 78 FORDHAM L. REV. 2615, 2619–20, 2626–27 (2010) (discussing the various burdens of proof in civil trials and the mechanics of the clear and convincing evidence standard).

54*. See In re* TLI Commc'ns LLC Pat. Litig., 87 F. Supp. 3d 773, 797 n.48 (E.D. Va. 2015) (discussing the district court split over whether the clear and convincing evidence standard should be applied to eligibility), *aff'd*, 823 F.3d 607 (Fed. Cir. 2016); *see also* Maria R. Sinatra, *Do Abstract Ideas Have the Need, the Need for Speed?: An Examination of Abstract Ideas After* Alice, 84 FORDHAM L. REV. 821, 842 (2015).

55*. See* Phillips v. AWH Corp., 415 F.3d 1303, 1312 (Fed. Cir. 2005).

56*. See* Peter S. Menell, Matthew D. Powers & Steven C. Carlson, *Patent Claim Construction: A Modern Synthesis and Structured Framework*, 25 BERKELEY TECH. L.J. 711, 716 (2010).

57. Hoechst Celanese Corp. v. BP Chems. Ltd., 78 F.3d 1575, 1578 (Fed. Cir. 1996); *see also* Kimberly Moore, *Are District Court Judges Equipped to Resolve Patent Cases?*, 15 HARV. J.L. & TECH. 1, 8 (2001) (noting that claim construction is a critical inquiry, as the interpretation of the terms can be decisive in the outcome).

58*. See* Elf Atochem N. Am., Inc. v. Libbey-Owens-Ford Co., 894 F. Supp. 844, 850 (D. Del. 1995).

decision in *Markman v. Westview Instruments, Inc.*[59] has led many district courts to adopt a practice known as a *Markman* hearing, in which a judge hears arguments from the parties about how the claims should be construed.[60]

When construing a claim, a court will consider intrinsic evidence, which includes the claims, specification, and prosecution history of the patent.[61] The court may also consider extrinsic evidence, such as expert testimony, scientific principles, dictionary definitions, treatises, and other relevant information outside of the patent document and prosecution history.[62]

Although the ultimate decision on claim construction is a question of law reserved for the court,[63] the interpretation process may involve subsidiary questions of fact.[64] This is because the claims of a patent are drafted in the context of a specific invention, and the same term used in different patents may have different meanings depending on the context in which it is used.[65] As a result, interpreting a claim can be a highly fact- and case-specific inquiry, requiring careful consideration of the patent's language and the context of the claim in question.[66]

4. Rule 12 Motions and Subject Matter Eligibility

Rule 12 of the Federal Rules of Civil Procedure outlines the various pretrial motions that parties can use to challenge the pleadings of their opponents.[67] A defendant can move to dismiss a case under Rule 12(b)(6) for a "failure to state a claim upon which relief can be granted,"[68] or for a judgment on the pleadings under Rule 12(c).[69]

When bringing a Rule 12(b)(6) motion, a defendant can argue that the plaintiff either lacks a cognizable legal theory or that the facts presented by the plaintiff, even if accurate, are insufficient to support a plausible legal

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59. 517 U.S. 370 (1996).

60. *See* Sapna Kumar, *Judging Patents*, 62 Wm. & Mary L. Rev. 871, 889 (2021). *Markman* hearings are most commonly held during or after the fact discovery phase. *See* Menell et al., *supra* note 56, at 792.

61. *See* Phillips v. AWH Corp., 415 F.3d 1303, 1313, 1315 (Fed. Cir. 2005) (noting that the specification plays a crucial role in claim construction).

62. *See* Moore, *supra* note 57, at 5, 7. The Federal Circuit, however, has noted that extrinsic evidence is less authoritative than intrinsic evidence. *See Phillips*, 415 F.3d at 1317–18.

63. A "question of law" must be decided by a judge, while a "question of fact" must be decided by a jury or the factfinder. *See Question of Law*, Black's Law Dictionary (11th ed. 2019). The distinction between law and fact can be significant in litigation, as it determines the identity of the fact-finder, the standard of proof, and the standard of review on appeal. *See* Paul R. Gugliuzza, *Law, Fact, and Patent Validity,* 106 Iowa L. Rev. 607, 609–10 (2021).

64. *See* Teva Pharms. USA, Inc. v. Sandoz, Inc., 574 U.S. 318, 326 (2015).

65. *See* Emerson Elec. Co. v. SIPCO, LLC, 826 F. App'x 904, 914 (Fed. Cir. 2020).

66. *Id.* Claim construction can also play an important role in subject matter eligibility analysis. *See* Paul R. Gugliuzza, *The Procedure of Patent Eligibility*, 97 Tex. L. Rev. 571, 614–15 (2019).

67. Fed. R. Civ. P. 12.

68. Fed. R. Civ. P. 12(b)(6); *see also* Ashcroft v. Iqbal, 556 U.S. 662, 678 (2009).

69. Fed. R. Civ. P. 12(c).

theory.[70]   A party raising a Rule 12(c) motion asks the court to make a judgment based on the limited record available.[71]

In patent litigation, Rule 12 motions are subject to certain legal standards. First, the court is limited to consulting only (1) the complaint, (2) the patent, (3) the prosecution history,[72] and (4) exhibits attached to the pleading of "'unquestioned authenticity' that are . . . 'integral' to the pleader's claim for relief."[73]   Second, all factual allegations in the plaintiff's complaint must be accepted as true and construed in the light most favorable to the plaintiff.[74] The court is not required to construe legal conclusions in the plaintiff's favor.[75]   Therefore, if the plaintiff presents a plausible legal theory or facts to support a plausible legal theory, their complaint will survive a motion to dismiss.[76]

One common defense to a patent infringement suit is that the plaintiff's patent is invalid.[77]   Defenses of invalidity based on §§ 102, 103, and 112 of the Patent Act are typically not considered at the pleadings stage, as they are generally assumed to turn on underlying factual issues.[78]   However, because courts have characterized subject matter eligibility as a question of law,[79] a defendant can raise an ineligibility defense on a Rule 12(b)(6) or Rule 12(c) motion, arguing that the plaintiff's patent is not eligible for protection.[80]   This can be done by challenging the patent's eligibility under the statutory categories of § 101 or by arguing that it falls within one of the judicial

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70. *See Iqbal*, 556 U.S. at 678.

71. Rule 12(c) and 12(b)(6) motions both require a complaint to assert sufficient facts to support a plausible legal cause of action, but a 12(b)(6) motion must be filed before an answer to the complaint, while a 12(c) motion may be filed after the pleadings are closed but before trial. *See* FED. R. CIV. P. 12(c); Robert Daniel Garza, *Software Patents and Pretrial Dismissal Based on Ineligibility*, 24 RICH. J.L. & TECH. 1, 43–44 (2018).

72. *See* Data Engine Techs. LLC v. Google LLC, 906 F.3d 999, 1008 n.2 (Fed. Cir. 2018) (noting that prosecution history is part of the record that can be considered at the pleadings stage).

73. 5C CHARLES ALAN WRIGHT & ARTHUR R. MILLER, FEDERAL PRACTICE AND PROCEDURE § 1366 (3d ed. 2023); *see* MyMail, Ltd. v. ooVoo, LLC, 934 F.3d 1373, 1378–79 (Fed. Cir. 2019).   Consulting extrinsic sources outside of these categories may convert the motion into one for summary judgment. *See* FED. R. CIV. P. 12(d).

74. *See* Aatrix Software, Inc. v. Green Shades Software, Inc., 890 F.3d 1354, 1358 (Fed. Cir. 2018).

75. *See Iqbal*, 556 U.S. at 678.

76. *See id.*

77. *See* 35 U.S.C. § 282(b)(2).

78. *See* Gugliuzza, *supra* note 66, at 588.

79. *See, e.g.*, Intell. Ventures I LLC v. Erie Indem. Co., 850 F.3d 1315, 1325 (Fed. Cir. 2017) (noting that "patent eligibility under § 101 is an issue of law"); Amdocs (Israel) Ltd. v. Openet Telecom, Inc., 841 F.3d 1288, 1293 (Fed. Cir. 2016) (noting that the court reviews a district court's eligibility determination without deference as a question of law; DDR Holdings, LLC v. Hotels.com, L.P., 773 F.3d 1245, 1255 (Fed. Cir. 2014) (noting that eligibility is subject to a de novo standard of review).

80. Garza, *supra* note 71, at 42. A claim construction hearing is not required to examine subject matter eligibility, so a court can determine if the patent satisfies § 101 based on the pleadings alone. For § 101 cases decided without claim construction, see, for example, Bilski v. Kappos, 561 U.S. 593 (2010); Alice Corp. v. CLS Bank Int'l, 573 U.S. 208 (2014).

exceptions to patent eligibility: abstract ideas, laws of nature, and natural phenomena.[81]

B. Software 101

Software consists of a set of instructions and rules that tell a computer how to perform specific tasks.[82] It is functionally tied to hardware, but it is intellectually independent because it can be implemented on a variety of different devices.[83]

Abstraction is a fundamental concept in computer science that involves removing unnecessary details and simplifying a problem in order to understand its essence.[84] It is often used in software development to manage complex systems by ignoring granular details and focusing on higher-level problems.[85] In large-scale problems, software is divided into several layers of abstraction, with the highest level defining the essential architecture of the program.[86] Each nested module operates independently but interacts with the others to achieve the desired result.[87]

The concept of abstraction is significant in understanding the difficulty of applying the doctrine of abstract ideas in the context of software development.[88] Software often involves abstractions that are crucial for building complex systems, thus complicating the distinction between abstract ideas and inventive concepts in the context of software patents.[89]

C. The History of Abstract Ideas

The abstract ideas exception to § 101 is the subject of a lengthy and complex body of case law spanning U.S. history. This section offers a broad

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81. *See* Garza, *supra* note 71, at 15, 17, 42.

82*. See Software*, ENCYCLOPEDIA BRITANNICA, https://www.britannica.com/technology/ software [https://perma.cc/3VN5-H7M9] (last visited Sept. 3, 2023).

83. *Id.*

84*. See* STEVE MCCONNELL, CODE COMPLETE 89 (2d ed. 2004) ("From a complexity point of view, the principal benefit of abstraction is that it allows you to ignore irrelevant details."); Paul Curzon, Tim Bell, Jane Waite & Mark Dorling, *Computational Thinking, in* THE CAMBRIDGE HANDBOOK OF COMPUTING EDUCATION RESEARCH 513, 526 (Sally A. Fincher & Anthony V. Robins eds., 2019).

85. *See* Curzon et al., *supra* note 84, at 526–27; *see also* DEXTER C. KOZEN, AUTOMATA AND COMPUTABILITY 5 (1997).

86*. See* DAVID EVANS, INTRODUCTION TO COMPUTING: EXPLORATIONS IN LANGUAGE, LOGIC, AND MACHINES 38 (2011); Mohsen Dorodchi, Nasrin Dehbozorgi, Mohammadali Fallahian & Seyedamin Pouriyeh, *Teaching Software Engineering Using Abstraction Through Modeling*, INFORMATICS IN EDUCATION 515, 520–21 (2021). For a few simple explanations of abstraction, see *Abstract Class in Java*, JAVA T POINT, https://www.javatpoint.com/abstract-class-in-java [https://perma.cc/T2TT-ADVY] (last visited Sept. 3, 2023).

87. *See* Dorodchi et al., *supra* note 86, at 518, 520–21; MCCONNELL, *supra* note 84, at 89–90.

88*. See generally* Athul K. Acharya, *Abstraction in Software Patents (and How to Fix It)*, 18 J. MARSHALL REV. INTELL. PROP. L. 364, 364–73 (2019) (discussing the tension between software abstraction and eligibility).

89*. Id.*

overview of how the abstraction tests have evolved, with a particular focus on software-specific eligibility tests after the 1960s.

1. Early History

Patents are a legal concept that have been integral to the U.S. legal system since the country's founding.[90] The first patent act was passed in 1790, granting patents for "useful Arts."[91] Over the years, the laws governing the patent system have evolved, reaching their modern form in the Patent Act of 1952,[92] which established the USPTO and outlined the requirements for obtaining and enforcing a patent.[93]

The concept of the abstract ideas exception to patent eligibility has been established and interpreted through case law for over 170 years.[94] The precise contours of what constitutes an ineligible abstract idea, however, have shifted over time.[95] Nevertheless, the underlying principle behind the abstract ideas exception has remained consistent: to prevent the monopolization of basic concepts, ensuring that innovators have free access to fundamental ideas.[96]

2. 1960–1981: The Emergence of Software Patents and the *Benson*, *Flook*, and *Diehr* Trilogy

The emergence of computer programs in the 1960s posed a challenge for the patent system as those in the field contemplated how to adapt to this new technology.[97] Despite initial concerns about the patentability of software-related inventions, patents on computer programs were granted toward the end of the decade.[98] To incorporate software into the patent system, courts developed a variety of eligibility tests.

In *Gottschalk v. Benson*,[99] the Supreme Court was asked for the first time whether a computer-implemented invention was patent-eligible.[100] The invention at issue involved a computerized method of converting

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90. *See* U.S. CONST. art. I, § 8, cl. 8 (empowering Congress to "promote the Progress of Science and useful Arts, by securing for limited Times to . . . Inventors the exclusive Right to their respective . . . Discoveries.").

91. Patent Act of 1790, ch. 7, 1 Stat. 109–12.

92. 35 U.S.C. §§ 1–390.

93. *Id.*

94. *See* Le Roy v. Tatham, 55 U.S. 156, 175 (1852) ("A principle, in the abstract, is a fundamental truth; . . . these cannot be patented, as no one can claim in either of them an exclusive right.").

95. *See infra* Part I.C.2–4.

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

97. *See* STAFF OF S. COMM. ON THE JUDICIARY, 90TH CONG., REP. ON THE PRESIDENT'S COMM'N ON THE PATENT SYS. 20 (Comm. Print 1966) (proposing a categorical exclusion of software from patent eligibility). *See generally* David Bender, *Computer Programs: Should They Be Patentable?*, 68 COLUM. L. REV. 241 (1968) (arguing in favor of patent protection).

98. *See In re* Bernhart, 417 F.2d 1395 (C.C.P.A. 1969). The claim at issue was a machine claim rather than a process claim. Accordingly, the court reasoned that the computer program created a *new* machine and was therefore valid. *Id.* at 1400.

99. 409 U.S. 63 (1972).

100. *Id.*

binary-coded decimals[101] into pure binary format, a significant improvement in speed and accuracy over past pen-and-paper methods.[102] After an initial rejection and an appeal, Benson's claim ultimately made its way to the Supreme Court.[103] The Court ultimately rejected Benson's claim, citing early precedent stating that "[w]hile a scientific truth, or the mathematical expression of it, is not a patentable invention," novel and useful structures created with such concepts might be.[104] Further, the Court noted that the claim was "so abstract and sweeping as to cover both known and unknown uses" of the underlying algorithm, amounting to a monopoly over the algorithm itself.[105] However, the Court made clear that its decision should not be interpreted as categorically excluding software from patent eligibility.[106] The *Benson* opinion set forth what would come to be known as the "mathematical algorithm exception," which provides that a computerized mathematical algorithm is patent-ineligible.[107]

Six years later, the Supreme Court reaffirmed the mathematical algorithm exception in *Parker v. Flook*.[108] The case involved a claim for a computerized method that recorded a temperature measurement, used an algorithm to calculate a value, and later updated the value.[109] The only difference between the method at issue and conventional methods was the algorithm.[110] The Court first held that the algorithm itself, even though it operated on a computer, was ineligible under the holding in *Benson*.[111] The Court further held that a post-solution activity—i.e., attaching a step to a mathematical procedure—cannot transform an ineligible claim into an eligible one.[112] Using this logic, the Court reasoned that a clever drafter could patent any mathematical formula by adding a post-solution activity.[113]

In 1981, the Supreme Court in *Diamond v. Diehr*[114] held that a computer-implemented invention was *eligible*, clarifying the standards for

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101. Digital computers understand information in binary-coded decimal format, but binary format is difficult for humans to comprehend. *See In re* Benson, 441 F.2d 682, 683 (C.C.P.A. 1971), *rev sub nom.* Gottschalk v. Benson, 409 U.S. 63 (1972).

102. *Id.*

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

104. *See id.* at 67 (alteration in original) (quoting Mackay Radio & Tel. Co. v. Radio Corp. of Am., 306 U.S. 86, 94 (1939)).

105. *Benson*, 409 U.S. at 68.

106. *Id.* at 72–73.

107. The *Benson* court also applied the machine-or-transformation test, which provides that a process that (1) uses a machine in a novel manner or (2) transforms an article into a "different state or thing" is eligible. *See id.* at 67, 70. As Benson's method could be done without a computer and merely converted one form of number to another, it failed both prongs of the test. *See id.* at 67.

108. 437 U.S. 584 (1978).

109. *See id.* at 585–86.

110. *Id.*

111. *Id.* at 589–90.

112. *Id.* at 590–91.

113. *See id.* at 590 ("A competent draftsman could attach some form of post-solution activity to almost any mathematical formula.").

114. 450 U.S. 175 (1981).

patent eligibility in the wake of the *Benson* and *Flook* decisions.[115] The case involved a process that used the well-known Arrhenius equation, and the Court had to determine whether it fell under the mathematical algorithm exception.[116] The Court drew on early precedent, stating that a "novel and useful structure created with the aid of knowledge of scientific truth" may be patent-eligible.[117]   The Court further held that although the Arrhenius equation itself was not patentable in isolation, incorporating it into an efficient and novel solution created an eligible patent.[118] As this decision held in favor of eligibility, it helped to further define the eligibility standards for software and computer-implemented inventions.

3. 1981–1999: Wrestling with Software Patents from *Diehr* to *AT&T*

The *Benson*, *Flook*, and *Diehr* trilogy birthed a series of related tests for abstractness.   One variant, dubbed the *Freeman-Walter-Abele* test, came from three cases decided by the U.S. Court of Customs and Patent Appeals.[119] The test involved a two-step inquiry: first, determine whether the claim recites an algorithm[120] as defined by *Benson*;[121] second, determine whether it is "applied in any manner to physical elements or process steps."[122] Courts applied the *Freeman-Walter-Abele* test through the early 1990s.[123]   Nevertheless, uncertainty surrounding the scope of *Benson*'s definition of a mathematical algorithm made applying the first part of the test challenging.[124]

In 1994, the Federal Circuit's decision in *In re Alappat*[125] introduced the "useful, concrete, and tangible result" inquiry, departing from the *Freeman-Walter-Abele* test.[126] The case involved an invention that used a

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115*. See id.* at 192–93.

116*. Id.* at 177–78.

117*. Id.* at 188 (quoting Mackay Radio & Tel. Co. v. Radio Corp. of Am., 306 U.S. 86, 94 (1939)).

118*. See id.* at 192–93. The Court noted that because the process transformed uncured rubber into cured rubber, i.e., a "different state or thing," it satisfied the machine-or-transformation test. *Id.* at 184.

119*. See In re* Freeman, 573 F.2d 1237 (C.C.P.A. 1978); *In re* Walter, 618 F.2d 758 (C.C.P.A. 1980); *In re* Abele, 684 F.2d 902 (C.C.P.A. 1982). All three cases were abrogated by *In re* Bilski, 545 F.3d 943 (Fed. Cir. 2008), *aff'd sub nom.* Bilski v. Kappos, 561 U.S. 593 (2010).

120. The *Benson* Court defined an algorithm as "[a] procedure for solving a given type of mathematical problem." *See* Gottschalk v. Benson, 409 U.S. 63, 65 (1972).

121*. See generally Freeman*, 573 F.2d 1237; *Walter*, 618 F.2d 758; *Abele*, 684 F.2d 902.

122*. Abele*, 684 F.2d at 906.

123*. See In re* Alappat 33 F.3d 1526, 1537 (Fed. Cir. 1994) (signaling the courts' transition away from the *Freeman-Walter-Abele* test), *abrogated by In re* Bilski, 545 F.3d 943 (Fed. Cir. 2008), *aff'd sub nom.* Bilski v. Kappos, 561 U.S. 593 (2010).

124*. See, e.g.*, *In re* Warmerdam, 33 F.3d 1354, 1359 (Fed. Cir. 1994) ("The difficulty is that there is no clear agreement as to what is a 'mathematical algorithm,' which makes rather dicey the determination of whether the claim as a whole is no more than that.").

125. 33 F.3d 1526 (Fed. Cir. 1994), *abrogated by In re* Bilski, 545 F.3d 943 (Fed. Cir. 2008), *aff'd sub nom.* Bilski v. Kappos, 561 U.S. 593 (2010).

126*. Id.* at 1544.

mathematical formula to adjust the visual representation of a waveform.[127]
The court determined that it was eligible for a patent as a "machine," citing
the fact that the elements of the invention were assembled to create a "useful,
concrete, and tangible result."[128] Notably, the court held that a computer
program can create a new machine by transforming a general-purpose
computer into a special-purpose computer.[129]

State Street Bank & Trust Co. v. Signature Financial Group, Inc.,[130]
decided in 1998, reflected the continuing trend toward acceptance of
software-related patents.[131] In this case, the claim at issue involved a
business method[132] for organizing investments in a manner that provided tax
benefits to shareholders.[133] The court found that using mathematical
calculations to transform data constituted the "practical application" of a
mathematical formula, since it produced a "useful, concrete, and tangible
result."[134] Further, the court repudiated the "business method exception,"
which provided that business methods should be categorically excluded from
subject matter eligibility, noting that the language of § 101 suggests no such
restriction.[135]

Following *State Street*, the Federal Circuit in *AT&T Corp. v. Excel
Communications, Inc.*[136] reaffirmed its approval of software-related patents
and its rejection of the business method exception.[137] The case involved a
business method claim that calculated billing rates based on caller
information, and the court found it to be eligible for a patent.[138] Finding the
claim patent-eligible, the court noted that the evolution of computer
technology warranted a reexamination of the rules governing eligibility,
highlighting the tension between computer software and the mathematical
algorithm exception.[139] Ultimately, the court held that the claimed process
produced a "useful, concrete, tangible result" and did not pose a preemption

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127. *Id.* at 1537.
128. *Id.* at 1544.
129. *See id.* at 1545.
130. 149 F.3d 1368 (Fed. Cir. 1998), *abrogated by In re* Bilski, 545 F.3d 943 (Fed. Cir.
2008), *aff'd sub nom.* Bilski v. Kappos, 561 U.S. 593 (2010).
131. *See id.*
132. Business methods refer to a category of patents, primarily technology-based, which
protect methods of doing business. *See Business Methods*, U.S. PAT. & TRADEMARK OFF.,
https://www.uspto.gov/patents/basics/types-patent-applications/utility-patent/patent-business
[https://perma.cc/RJ7N-7G9C] (May 31, 2023). These patents generally arise in areas such
as e-commerce, financial services, data processing, and other technology-based services. *See
id.*
133. *See State Street*, 149 F.3d at 1368. Signature's patented method operated as follows:
mutual funds pooled their assets into an investment portfolio organized as a partnership, which
provided tax benefits to shareholders. *Id.* at 1370.
134. *Id.* at 1373.
135. *See id.* at 1373 (noting that the use of the term "any" in § 101 indicated Congress's
intent for a broad approach to eligibility).
136. 72 F.3d 1352 (Fed. Cir. 1999), *abrogated by In re* Bilski, 545 F.3d 943 (Fed. Cir.
2008), *aff'd sub nom.* Bilski v. Kappos, 561 U.S. 593 (2010).
137. *Id.*
138. *See id.* at 1355.
139. *See id.* at 1356.

issue, thus falling within the scope of § 101.[140] With these two decisions, judicial acceptance of software patents reached a high point at the end of the millennium.

4. 2000–2014: Reining in Software Patents from *Bilski* to *Alice & Mayo*

The *State Street* and *AT&T* decisions were followed by a sharp increase in business method patent applications and issuances.[141] The combination of the exponential technological growth of the early 2000s and the fall of the business method exception in *State Street* and *AT&T* likely contributed to this increase.[142] However, this flood of business method patents came with various social and economic costs.[143]

Nearly a decade after *AT&T*, the Federal Circuit abrogated the *State Street* decision in *In re Bilski*,[144] holding that a business method patent application claiming a method of hedging risk in the field of commodities trading was invalid.[145] The Federal Circuit sitting en banc formally repudiated the *Freeman-Walter-Abele* test and established the machine-or-transformation test as the definitive test for process patent eligibility.[146] Applying the test, the court found that the claim was neither tied to a machine nor transformative and was therefore ineligible.[147] The Federal Circuit's majority opinion was met with three strong dissents, which argued that it was "contrary to statute, contrary to precedent, and a negation of the constitutional mandate";[148] "too easily circumvented";[149] and "invent[ed] several circuitous and unnecessary tests."[150]

The Supreme Court granted certiorari, revisiting patent eligibility for the first time in nearly thirty years. In *Bilski v. Kappos,*[151] the Court affirmed the Federal Circuit's invalidation of the patent but criticized the rigid adoption of the machine-or-transformation test.[152] The Court noted that the machine-or-transformation test could be a useful inquiry but that using it as the sole test for process patents violated fundamental principles of statutory

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140. *Id.* at 1358.

141. *See* U.S. Gov't Accountability Off., GAO-13-465, Intellectual Property: Assessing Factors That Affect Patent Infringement Litigation Could Help Improve Patent Quality 14 (2013) (noting that software-related patents grew from 20 percent of all patents in 1991 to around 50 percent in 2011).

142. *See* Michael J. Meurer, *Business Method Patents and Patent Floods*, 8 Wash. U. J.L. & Pol'y 309, 313–14 (2002).

143. *See id.* at 322 (noting that patent floods exacerbate licensing and litigation costs, result in improper denials, and stifle innovation).

144. 545 F.3d 943 (Fed. Cir. 2008), *aff'd sub nom.* Bilski v. Kappos, 561 U.S. 593 (2010).

145. *See id.*

146. *See id.* at 954–55.

147. *See id.* at 966.

148. *Id.* at 976 (Newman, J. dissenting).

149. *Id.* at 1008 (Mayer, J. dissenting).

150. *Id.* at 1015 (Rader, J. dissenting).

151. 561 U.S. 593 (2010).

152. *See id.* at 604 ("The Court of Appeals incorrectly concluded that this Court has endorsed the machine-or-transformation test as the exclusive test.").

interpretation.[153] Thus, the Court looked to the text of § 101, ultimately holding that the petitioner's business method was not eligible as a process, since it claimed a fundamental economic practice.[154] Although *Bilski* clarified the status of the machine-or-transformation test, it did not solve the underlying problem of defining abstractness. Future courts were forced to wade through the "swamp of verbiage [of] § 101" precedent to search for abstract ideas.[155]

Four years after *Bilski*, the Supreme Court reconsidered the abstract ideas doctrine in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*,[156] examining whether a multistep method for calibrating the dosage of a medication was eligible for a patent.[157] The Court set forth a few guiding principles. First, abstract ideas are not patentable, as they are the "basic tools of scientific and technological work."[158] Second, because all inventions "at some level embody, use, reflect, rest upon, or apply . . . abstract ideas,"[159] an abstract idea can be transformed into a patentable invention if it adds more to the law of nature, rather than merely applying it.[160] Third, determining eligibility involves considering whether the claim just recites the abstract idea or whether it adds anything of "significance to the natural laws."[161] Finally, the Court cautioned that the abstract ideas exception should be applied with caution, as "too broad an interpretation of this exclusionary principle could eviscerate patent law."[162]

Although some guiding principles were set forth by the *Mayo* Court, uncertainty surrounding how to define abstract ideas persisted. This uncertainty was apparent in *CLS Bank International v. Alice Corp.*,[163] in which a fractured Federal Circuit issued seven separate opinions with no firm resolution.[164]

Alice Corporation owned four business method patents covering a computerized trading platform designed to address the issue of "settlement risk," which is the risk that only one party to a transaction will fulfill their obligation.[165] The patents claimed a computerized system that creates "shadow records" of the parties' real-world bank accounts and instructs one party on whether the other has sufficient resources to complete the

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153. *See id.* at 603 ("This Court has not indicated that the existence of these well-established exceptions gives the Judiciary *carte blanche* to impose other limitations that are inconsistent with the text and the statute's purpose and design.").

154. *See id.* at 611.

155. MySpace, Inc. v. GraphOn Corp., 672 F.3d 1250, 1260 (Fed. Cir. 2012).

156. 566 U.S. 66 (2012).

157. *See id.* at 77–79.

158. *Id.* at 71 (quoting Gottschalk v. Benson, 409 U.S. 63, 67 (1972)).

159. *Id.*

160. *See id.* at 72.

161. *Id.* at 87. The Court found that the claims at issue did not add anything of significance to natural laws and were not limited to a specific application, leading to preemption concerns. *Id.*

162. *Id.* at 71.

163. 717 F.3d 1269 (Fed. Cir. 2013), *aff'd,* 573 U.S. 208 (2014).

164. *See id.*

165. *Id.* at 1274.

transaction.[166] The Federal Circuit sitting en banc reviewed the lower court's grant of summary judgment invalidating the patents[167] and applied a multipart analysis.[168]

First, the court determined whether the claimed invention fit within one of the four statutory categories outlined in § 101.[169] Second, it evaluated whether the claim posed a risk of preempting an abstract idea.[170] This second step encompassed a three-part analysis, which involved (1) identifying the abstract idea wrapped up in the claim,[171] (2) defining the abstract idea,[172] and (3) looking for an inventive concept or "genuine human contribution."[173] The plurality opinion decided that the claims at issue were within the statutory categories but were directed to abstract ideas and failed to claim an inventive concept under the final step, rendering them ineligible.[174]

After the Federal Circuit held that the claims were ineligible, the Supreme Court considered the issue in *Alice Corp. v. CLS Bank International*.[175] Building on *Mayo*, the Court condensed the Federal Circuit's four-step test into a two-step inquiry: (1) determine whether the claim is directed to an abstract concept; and if it is, (2) determine whether it contains an "inventive concept" that transforms the idea into something eligible and sufficiently limits the abstract idea.[176] Applying this to the claim at issue, the Court first found that the computer-implemented method for mitigating settlement risk[177] was directed to the abstract concept of intermediated settlement.[178] Second, the Court found that the invention merely used the computer as a tool to implement the existing abstract concept, rather than transforming it enough to make it inventive.[179] Although the *Alice* Court set forth a new test for determining eligibility, the Court explicitly dodged the issue of defining abstractness.[180]

To summarize, several eligibility tests have been developed to determine the patentability of software-related inventions. Included was the mathematical algorithm exception, derived from *Gottschalk v. Benson*, which held that mathematical algorithms applied to a computer are not

166. *Id.* at 1275.

167. Although *Alice* was decided at summary judgment, the parties did not go through formal claim construction. *Id.* However, the parties did agree on a construction favorable to Alice. *See id.*

168. *Id.*

169. *Id.* at 1282.

170. *Id.*

171. *Id.*

172. *Id.* at 1283.

173. *Id.*

174. *See id.* at 1292.

175. 573 U.S. 208 (2014).

176. *Id.* at 217–18.

177. *See id.* at 212–13.

178. *See id.* at 218.

179. *See id.* at 221.

180. *See id.* (noting that "we need not labor to delimit the precise contours of the 'abstract ideas' category").

patent-eligible unless they have a sufficiently novel application.[181]   The machine-or-transformation test, now a secondary test that can still be useful as an analytical tool, assesses whether a process claim is tied to a specific machine or apparatus or transforms an article into a different state or thing.[182] The now obsolete[183] *Freeman-Walter-Abele* test evaluated whether a claim recited an algorithm as defined in *Benson* and whether that algorithm was applied to physical elements or process steps.[184] The useful, concrete, and tangible result inquiry—established in *In re Alappat*, which held that a practical application of an abstract idea producing a "useful, concrete, and tangible result" was patent-eligible—was later rejected in *In re Bilski*.[185] The current primary test is the two-step *Alice*/*Mayo* test, which first determines if the claim is "directed to" an abstract concept and then evaluates whether it contains an "inventive concept."[186]

The two-step test outlined in *Mayo* and *Alice* governs § 101 inquiries today. Nevertheless, the underlying confusion over "abstract ideas" has persisted.[187]

II. Defining Abstractness in Two Steps

Despite over forty years of software patent cases, courts have failed to provide a concrete definition of abstract ideas, often explicitly dodging the issue.[188]   Although *Alice* and *Mayo* delineated a two-part analysis, the confusion over abstractness combined with the inherently abstract nature of software has persisted.[189]

This section first discusses the current application of the *Alice*/*Mayo* test. It then examines how courts have attempted to make sense of the uncertainty by adopting a few subsidiary tests.   Third, it discusses procedural and substantive points of tension surrounding the test, as well as the impact of that tension.

A. Shadow Tests for Abstraction

The absence of a definition for abstraction fits the nature of the problem. As Judge Jimmie V. Reyna noted, "[t]he problem with articulating a single, universal definition of 'abstract idea,' is that it is difficult to fashion a

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181. *See* Gottschalk v. Benson, 409 U.S. 63, 68 (1972); Parker v. Flook, 437 U.S. 584, 590 (1978); Diamond v. Diehr, 450 U.S. 175 (1981).

182. *In re* Bilski, 545 F.3d 943, 954 (Fed. Cir. 2008), *aff'd sub nom.* Bilski v. Kappos, 561 U.S. 593 (2010).

183. *See* State St. Bank & Tr. Co. v. Signature Fin. Grp., Inc, 149 F.3d 1368, 1374 (Fed. Cir. 1998) (repudiating the *Freeman-Walter-Abele* test), *abrogated by In re* Bilski, 545 F.3d 943 (Fed. Cir. 2008), *aff'd sub nom.* Bilski v. Kappos, 561 U.S. 593 (2010).

184. *In re* Bilski, 545 F.3d at 959.

185. *In re* Alappat, 33 F.3d 1526, 1537 (Fed. Cir. 1994), *abrogated by In re* Bilski, 545 F.3d 943 (Fed. Cir. 2008), *aff'd sub nom.* Bilski v. Kappos, 561 U.S. 593 (2010); *State Street*, 149 F.3d at 1373; *In re* Bilski, 545 F.3d at 959.

186. Alice Corp. v. CLS Bank Int'l, 573 U.S. 208, 217 (2014).

187. *See infra* Part II.A.

188. *See, e.g.*, *Alice*, 573 U.S. at 231.

189. *See infra* Part II.B.

workable definition to be applied to as-yet-unknown cases with as-yet-unknown inventions."[190] Without a definition, courts adopted an "abstract-by-analogy" approach, comparing the claim at issue to past abstract claims.[191]

Surveying case law under § 101 reveals a few recurring categories of abstract ideas, including mathematical concepts,[192] methods of organizing human activity,[193] and mental processes.[194] In addition to these categories, courts have also adopted a few loosely defined "shadow" tests to help evaluate whether a claimed invention is directed to an abstract idea.[195] These shadow tests, which this section discusses in detail, may be used in addition to, or in conjunction with, the recurring categories of abstract ideas to aid in the determination of patent eligibility.

1. Improvements to Computer Technology

Under this line of cases, claims which contribute an improvement to computer technology, rather than recite a concept that can be implemented on any general computer, are considered not directed to an abstract idea at step one of the *Alice/Mayo* test. This test, as articulated in *Enfish, LLC v. Microsoft Corp.*,[196] provides that "the first step in the *Alice* inquiry . . . asks whether the focus of the claims is on the specific asserted improvement in computer capabilities . . . or, instead, on a process that qualifies as an 'abstract idea' for which computers are invoked merely as a tool."[197] The two cases below illustrate the application of this shadow test.

In *Enfish*, the claim at issue involved a method of storing data in a "self-referential" table,[198] which was an improvement over traditional data storage structures.[199] Enfish brought an infringement suit against Microsoft, who moved for summary judgment, arguing that Enfish's claims were

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190. Amdocs (Israel) Ltd. v. Openet Telecom, Inc., 841 F.3d 1288, 1294 (Fed. Cir. 2016).

191. *See generally, e.g.*, Enfish, LLC v. Microsoft Corp., 822 F.3d 1327, 1334 (Fed. Cir. 2016) (noting that courts previously found it sufficient to compare the claims at issue to those previously found to be directed to an abstract idea); *Amdocs*, 841 F.3d at 1294 (noting that the analogical approach is "the classic common law methodology for creating law when a single governing definitional context is not available").

192. *See generally, e.g.*, Gottschalk v. Benson, 409 U.S. 63 (1972); Parker v. Flook, 437 U.S. 584 (1978); Diamond v. Diehr, 450 U.S. 175 (1981); Digitech Image Techs., LLC v. Elecs. for Imaging, Inc., 758 F.3d 1344 (Fed. Cir. 2014).

193. *See, e.g.*, Bilski v. Kappos, 561 U.S. 593 (2010); Alice Corp. v. CLS Bank Int'l, 573 U.S. 208 (2014); OIP Techs., Inc. v. Amazon.com, Inc., 788 F.3d 1359 (Fed. Cir. 2015); Secured Mail Sols. LLC v. Universal Wilde, Inc., 873 F.3d 905 (Fed. Cir. 2017); Bascom Glob. Internet Servs., Inc. v. AT&T Mobility LLC, 827 F.3d 1341 (Fed. Cir. 2016).

194. *See generally, e.g.*, Gottschalk v. Benson, 409 U.S. 63 (1972); CyberSource Corp. v. Retail Decisions, Inc., 654 F.3d 1366 (Fed. Cir. 2011); Mayo Collaborative Servs. v. Prometheus Lab'ys, Inc., 566 U.S. 66 (2012).

195. *See infra* Part II.B.

196. 822 F.3d 1327 (Fed. Cir. 2016).

197. *Id.* at 1335–36.

198. *Id.* at 1330.

199. *See id.* at 1332, 1333.

ineligible under § 101.[200] The district court granted Microsoft's motion for summary judgment on the grounds that the claims were directed to the abstract idea of "storing, organizing, and retrieving memory in a logical table."[201]   However, the Federal Circuit, on appeal, rejected this characterization and reframed the claim as "specifically directed to a *self-referential* table for a computer database."[202]   Looking to the specification, the court noted that the invention was an improvement over traditional data structures.[203]

In *Bascom Global Internet Services, Inc. v. AT&T Mobility LLC,*[204] the claim at issue concerned a method of filtering content on the internet.[205] As prior filtering tools were too localized and inflexible, Bascom's patent used communication networks to efficiently provide individualized filtering, which had not been available in the past.[206] Bascom brought an infringement suit against AT&T, and AT&T filed a Rule 12(b)(6) motion, arguing that Bascom's claims were abstract and ineligible under § 101.[207]

The district court granted AT&T's motion to dismiss, holding that the claims were directed toward the abstract idea of filtering internet content[208] and contained "no more than routine additional steps involving generic computer components and the internet."[209] However, on appeal, the Federal Circuit was unable to determine whether the claims were directed to the abstract idea of filtering content.[210] Nevertheless, the court found the claims eligible under step two, as they "recite[d] a specific, discrete implementation of the abstract idea of filtering content," where the "particular arrangement of elements [was] a technical improvement" over previous methods.[211]

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200. Enfish, LLC v. Microsoft Corp., 56 F. Supp. 3d 1167, 1169 (C.D. Cal. 2014), *aff'd in part, vacated in part, rev'd in part*, 822 F.3d 1327 (Fed. Cir. 2016). The parties went through a formal claim construction process prior to Microsoft's motion for summary judgment. *See id.* at 1176.

201. *Id.* at 1176 (citing a history textbook to note that the use of tabular storage dates back to 1295 B.C.).

202. *Enfish*, 822 F.3d at 1337 (emphasis in original).

203. *See id.* at 1339.

204. 827 F.3d 1341 (Fed. Cir. 2016).

205. The patent aimed to allow users to control access to unwanted content, such as for parents managing what their children see on the internet or for companies restricting employee access. *See id.* at 1345.

206. The tool worked by (1) identifying the user's website request, (2) determining whether the user was allowed to access the site, and (3) either allowing or denying access accordingly. *See id*.

207. Bascom Glob. Internet Servs., Inc. v. AT & T Mobility LLC, 107 F. Supp. 3d 639, 640 (N.D. Tex. 2015), *vacated and remanded sub nom*. Bascom Glob. Internet Servs., Inc. v. AT&T Mobility LLC, 827 F.3d 1341 (Fed. Cir. 2016). Although the case was decided on a motion to dismiss, the parties held a claim construction hearing, and the disputed terms were construed by the district court. *See* Bascom Glob. Internet Servs., Inc. v. AT&T Corp., No. 14-CV-3942, 2017 WL 5905698, at *1 (N.D. Tex. Sept. 20, 2017).

208. *See Bascom*, 107 F. Supp. 3d at 647.

209. *Id.* at 655.

210. *See Bascom*, 827 F.3d at 1349.

211. *Id.* at 1350. Note that although the improvement inquiry tends to occur during step one of the *Alice* tests, courts sometimes consider improvements at step two. *See* Stephen Schreiner, Tom Scott & Jim Carmichael, *The Fed. Circ.'s Secret Merger of* Alice *Steps 1 and*

Thus, the claims constituted a tangible improvement, rather than merely using the computer as a tool for implementing an abstract concept.

Enfish and *Bascom* set forth the guiding standard that if a claim contributes to an improvement in computer technology, it is less likely to fail step one of the *Alice*/*Mayo* test. This determination can depend on how broadly or narrowly the claim is framed, with a narrower construction potentially being in a better position to pass the abstract-ideas hurdle.[212]

2. Technical Solutions to Technical Problems

Claims using technical means to solve uniquely technical problems are more likely to qualify for patent protection, even if the underlying idea is abstract. The presence of technical means or solutions to technical problems can appear at either step of the *Alice*/*Mayo* inquiry.

In *DDR Holdings, LLC v. Hotels.com*,[213] the claim at issue concerned a method of retaining web traffic by directing external links to a composite webpage.[214] The method allowed viewers to browse third-party content without leaving the host site by generating a new webpage with the look and feel of the host site, solving the issue of traffic loss when users were redirected to third-party sites.[215] After an infringement trial, the defendants moved for judgment as a matter of law, arguing that the plaintiff's patent claimed ineligible subject matter under § 101.[216] The district court denied the defendants' motions, holding that the plaintiff's claims were not abstract and satisfied the machine-or-transformation test.[217]

On appeal, the Federal Circuit applied the *Alice*/*Mayo* test.[218] At step one, the court distinguished the e-commerce claim from previous invalid "fundamental economic . . . practice" claims, holding that the claims addressed a "business challenge . . . *particular to* the Internet."[219] Thus, because the problem "specifically ar[ose] in the realm of computer networks," the solution was "necessarily rooted in computer technology," and DDR's claims were unlike past abstract business method claims that "merely recite[d] the performance of some business practice known from the pre-Internet world . . . on the Internet."[220] Further, the court held that the claim provided an inventive concept, as it offered a "specific way to automate

2, LAW360 (June 17, 2020, 4:40 PM), https://www.law360.com/articles/1280622/the-fed-circ-s-secret-merger-of-alice-steps-1-and-2 [https://perma.cc/9XBC-YVJH].

212. For further discussion on how the level of framing informs the eligibility outcome, see *infra* Part II.B.4.

213. 773 F.3d 1245 (Fed. Cir. 2014).

214*. See id.*

215*. See id.* at 1248–49.

216*. See* DDR Holdings, LLC v. Hotels.com, L.P., 954 F. Supp. 2d 509, 514, 515–16 (E.D. Tex. 2013), *aff'd in part, rev'd in part and remanded*, 773 F.3d 1245 (Fed. Cir. 2014).

217*. Id.* at 526–27. The district court case was decided before the *Alice* decision, so it did not use the *Alice*/*Mayo* two-step framework. *See id.* at 524–28.

218*. See DDR*, 773 F.3d at 1255.

219*. Id.* at 1257 (emphasis added).

220*. Id.* at 1257. However, the court cautioned "that not all claims purporting to address Internet-centric challenges are eligible for patent." *Id.* at 1258.

the creation of a composite web page . . . to solve a problem faced by websites on the Internet."[221] Thus, the court found that the patent's subject matter was eligible under step two of the *Alice* inquiry.[222]

In *Amdocs (Israel) Ltd. v. Openet Telecom, Inc.*,[223] the patent claims at issue concerned a method for efficiently handling and enhancing data for internet service providers to analyze internet usage information.[224] While the case was on appeal to the Federal Circuit, the Supreme Court rendered the *Alice* decision.[225] On remand from a claim construction and infringement dispute, Openet filed a motion for judgment on the pleadings, arguing that all of Amdocs' asserted claims were ineligible in light of the *Alice* decision.[226]

The district court found that the asserted claims of all four patents at suit failed both steps of the *Alice/Mayo* test,[227] but the Federal Circuit applied a hybrid step-one and step-two approach and held that all four disputed claims were eligible.[228] At step two, the court held that the claims offered an inventive concept by providing "an unconventional technological solution . . . to a technological problem."[229] Further, the court held that although the claims were facially similar to previous ineligible claims "involving the mere collection and manipulation of information," the claims at issue were more similar to eligible precedent, as they provided a technical solution to a technical problem.[230] *DDR* and *Amdocs* suggest that claims that solve problems specific to technology may meet the statutory eligibility requirement, particularly if the solution to the problem requires a technical approach.

3. Claiming Solutions or Claiming Results

Another criterion for determining eligibility is whether the claim describes a specific means for achieving a result, which is less likely to be considered abstract than a claim that simply describes the intended outcome of the

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221. *Id.* at 1259.
222. In a dissenting opinion, Judge Mayer argued that DDR's claim was analogous to a "store within a store," i.e., the concept of retaining visitors by presenting them with a visually similar platform while selling third party goods; therefore, the claim was merely the technological application of an existing business solution, similar to *Alice. See id.* at 1264–65 (Mayer, J. dissenting).
223. 841 F.3d 1288 (Fed. Cir. 2016).
224. *Id.*
225. Amdocs (Israel) Ltd. v. Openet Telecom, Inc., 56 F. Supp. 3d 813, 815–16 (E.D. Va. 2014), *rev'd and remanded*, 841 F.3d 1288 (Fed. Cir. 2016).
226. *See id.* at 815–16.
227. Specifically, the claims at issue were respectively directed to "correlating two network accounting records to enhance the first record," "using a database to compile and report on network usage [information]," "an abstract idea performed using purely conventional computer operations," and "reporting on the collection of network usage information from a plurality of network devices." *See id.* at 820, 823–25.
228. *Amdocs*, 841 F.3d at 1294, 1305.
229. *See id.* at 1299–300 (noting that claim one could be described as focusing on (1) correlating two network accounting records to improve the first record or (2) a computer program that receives initial information and correlates it with additional information).
230. *Id.* at 1300.

process. This standard was articulated in *SAP America, Inc. v. InvestPic, LLC*,[231] where the Federal Circuit observed that eligible claims often specify a particular method for achieving a result rather than merely claiming the result itself.[232] This theory was applied in the two cases discussed below.

Secured Mail Solutions LLC v. Universal Wilde, Inc.[233] concerned a patent related to addressing security issues in package delivery by allowing the sender to affix a scannable code to the outside of the package and allowing the recipient to verify the contents through a QR code or personalized website.[234] Secure Mail brought an infringement suit against Universal Wilde, who moved to dismiss the case on the grounds that all of the asserted claims were abstract and ineligible under § 101.[235] The district court dismissed the case, and the Federal Circuit upheld the decision on appeal.[236]

The Federal Circuit found that the claims embraced the abstract idea of using a marking to communicate information about a mail object[237] and that the claims were nonspecific, lacked technical detail, and cited well-known as well as conventional ways to achieve the result.[238] Essentially, rather than focusing on the "how" of the process, the claim was result-oriented and lacked inventiveness.[239]

The court in *Finjan, Inc. v. Blue Coat System, Inc.*,[240] on the other hand, found that the claims in the plaintiff's patent were eligible because they provided a multistep process for detecting and protecting against internet security threats, rather than simply claiming the result of detecting such threats.[241] On appeal from the district court's holding in favor of eligibility,[242] the Federal Circuit applied the *Alice/Mayo* test.[243] At step one, the court held that the claim was not just focused on the ultimate result of screening out viruses—instead, it provided many unique steps to get to that result.[244] Finjan's solution-focused approach, which included "specific

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231. 898 F.3d 1161 (Fed. Cir. 2018).

232. *Id.* at 1167.

233. 873 F.3d 905 (Fed. Cir. 2017).

234. *See* U.S. Patent No. 7,814,032 (filed Sept. 11, 2006). The inventors developed these patents after 9/11, hoping that the system "could protect mail recipients from possible anthrax or explosive attacks by mail because the system would permit recipients to verify the source of the package before opening it." *See* Secure Mail Sols. LLC v. Universal Wilde, Inc., 169 F. Supp. 3d 1039, 1041 (C.D. Cal. 2016), *aff'd sub nom.* Secured Mail Sols. LLC v. Universal Wilde, Inc., 873 F.3d 905 (Fed. Cir. 2017).

235. *Secure Mail*, 169 F. Supp. 3d at 1046. Although the case was heard on a Rule 12 motion, the district court had construed several of the claims at issue in a previous case. *See id.* at 1043–45.

236. *Secured Mail*, 873 F.3d at 907.

237. *Id.* at 911.

238. *Id.* at 912.

239. *See id.*

240. 879 F.3d 1299 (Fed. Cir. 2018).

241. *Id.* at 1305.

242. *See generally* Finjan, Inc. v. Blue Coat Sys., Inc., No. 13-CV-03999, 2015 WL 7351450 (N.D. Cal. Nov. 20, 2015), *aff'd in part, rev'd in part*, 879 F.3d 1299 (Fed. Cir. 2018).

243. *See Finjan*, 879 F.3d at 1305.

244. *Id.* at 1303–06.

steps—generating a security profile that identifies suspicious code and linking it to a downloadable—that accomplish the desired result," saved the claim from a finding of abstraction.[245]

In sum, the Federal Circuit has derived a few guideposts from the two-step *Alice* test. If a claim specifically improves computer technology, offers a technical solution to a technical problem, or focuses on solutions rather than desired results, then the claim is less likely to be abstract.

B. *Tension over* Alice/Mayo

Despite the various "shadow" tests that have helped courts interpret the *Alice/Mayo* test, the application of the test has been the subject of significant debate and conflicting standards. This is due, in part, to inconsistencies in the language analyzed,[246] confusion over technical improvements and issues,[247] and decisions made at specific stages of litigation.[248] These issues are explored in greater detail below.

1. Eligibility as a Legal or Factual Question

The Supreme Court has traditionally viewed the issue of patent validity as a question of law.[249] However, courts have qualified this statement by acknowledging that factual inquiries play a significant role in the novelty, nonobviousness, and definiteness requirements.[250] Eligibility, on the other hand, had previously been considered a *pure* question of law.[251] However, more recent case law seems to suggest, without directly confirming, the presence of factual issues in the inquiry.[252]

In 2018, the Federal Circuit in *Berkheimer v. HP Inc.*[253] acknowledged that the *Alice/Mayo* test includes subsidiary questions of fact.[254] Specifically, the "inventive concept" inquiry—which asks whether the claims offer something more than techniques that are "well-understood, routine, and conventional to a skilled artisan in the relevant field"—is a

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245. *Id.* at 1305.

246. *See generally* David Roulo, *Subject Matter 101: The Inconsistent Role the Patent Specification Plays in the Federal Circuit's Eligibility Analysis*, 97 CHI.-KENT L. REV. 221 (2022).

247. *See infra* Part II.B.4.

248. *See infra* Part II.B.2.

249. *See, e.g.*, Great Atl. & Pac. Tea Co. v. Supermarket Equip. Corp., 340 U.S. 147, 155 (1950) (Douglas, J. concurring) ("The standard of patentability is a constitutional standard; and the question of validity of a patent is a question of law.").

250. *See* Microsoft Corp. v. I4I Ltd. P'ship, 564 U.S. 91, 96–97 (2011) (discussing the factfinding that an examiner conducts in determining novelty and nonobviousness and how that informs an invalidity defense); Graham v. John Deere Co. of Kan. City, 383 U.S. 1, 17 (1966) (noting the factual nature of nonobviousness).

251. *See supra* note 79 and accompanying text.

252. *See, e.g.*, McRO, Inc. v. Bandai Namco Games Am. Inc., 837 F.3d 1299, 1314 (Fed. Cir. 2016) (holding that the "[d]efendants provided no *evidence*" to satisfy their argument in step one of the *Alice/Mayo* test on a 12(c) motion (emphasis added)); Gugliuzza, *supra* note 66, at 601–05.

253. 881 F.3d 1360 (Fed. Cir. 2018).

254. *See id.* at 1363.

"question of fact . . . [that] must be proven by clear and convincing evidence."[255] Just a week later, in *Aatrix Software, Inc. v. Green Shades Software, Inc.*,[256] the Federal Circuit reaffirmed the importance of factual considerations, stating that "there can be subsidiary fact[ual] questions which must be resolved en route to the ultimate legal determination" of patent eligibility.[257] These two decisions finally clarified what had previously been hinted at,[258] throwing the "patent bar into a tizzy."[259] The distinction between law and fact is significant for practitioners, as it affects the burden of proof in a validity dispute, particularly concerning the "clear and convincing evidence" requirement for a defendant challenging validity.[260]

2. Eligibility on the Pleadings

As an "ultimate question of law," patent eligibility is appropriate to consider at the pleadings stage.[261] Although courts rarely addressed eligibility on Rule 12 motions prior to the *Alice* decision, the number of early-stage § 101 disputes has risen in recent years.[262]

Resolving the abstract ideas exception early in litigation has both benefits and drawbacks. On the one hand, eligibility has been described as a "threshold test" or a "coarse filter" that can identify meritless claims and prevent unnecessary litigation over novelty and nonobviousness.[263] Some commentators and judges argue that eligibility should be analyzed before other questions of validity.[264] Early resolution offers additional practical benefits, such as conserving judicial resources,[265] serving as a deterrent against frivolous infringement lawsuits,[266] and providing an efficient way to

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255. *Id.* at 1368. Note that the "clear and convincing evidence" standard refers to the heightened burden of proof due to the presumption of validity. *See Microsoft Corp.*, 564 U.S. at 95.

256. 882 F.3d 1121 (Fed. Cir. 2018).

257. *Id.* at 1128.

258. *See, e.g.*, Meredith Addy, *Is There a Light at the End of the* Alice *Tunnel?*, IPWATCHDOG (Feb. 18, 2018, 11:13 AM), https://ipwatchdog.com/2018/02/18/light-end-alice-tunnel/id=93883/ [https://perma.cc/SF55-PWZP] (commenting on the opinion as a "relief," "vitally important," and "too good to be true").

259. *See* Gugliuzza, *supra* note 66, at 606.

260. *See* Google LLC v. Sonos, Inc., 498 F. Supp. 3d 1138, 1144 (N.D. Cal. 2020) (discussing the issues surrounding the evidentiary standards and requisite burdens of proof).

261. *See supra* Part I.A.4.

262. *See* Gugliuzza, *supra* note 66, at 614 (noting that Rule 12 dismissals before *Alice* were rare); Andrew Kanel, *The Federal Circuit's Treatment of Rule 12 Dismissals for Lack of Patent Eligible Subject Matter*, 53 AKRON L. REV. 1053, 1057 (2019).

263. *See* Rsch. Corp. Techs. v. Microsoft Corp., 627 F.3d 859, 869 (Fed. Cir. 2010) (describing § 101 as a "coarse eligibility filter"); Ultramercial, Inc. v. Hulu, LLC, 772 F.3d 709, 717 (Fed. Cir. 2014) (Mayer, J. concurring) (describing § 101 as a threshold test).

264. *See* Gugliuzza, *supra* note 66, at 594; *Ultramercial*, 772 F.3d at 718. District courts, however, have the power to control the litigation process, including the order in which they consider validity issues. *See* MySpace, Inc. v. GraphOn Corp., 672 F.3d 1250, 1260 (Fed. Cir. 2012) (noting the value of addressing §§ 102, 103, and 112 validity issues before § 101 to end litigation earlier and avoid "enter[ing] the murky morass" of § 101 jurisprudence).

265. *See Ultramercial*, 772 F.3d at 718.

266. *Id.* at 719.

clear the "patent thicket" and eliminate patents that stifle innovation.[267] Moreover, patent litigation is often costly, and the expenses associated with discovery, *Markman* hearings, trial, and potential damage awards can be substantial for patent litigants.[268]

On the other hand, certain factors lean in favor of postponing the abstract ideas inquiry until after the Rule 12 stage. First, the factual nature of eligibility conflicts with the undeveloped factual record at the pleadings stage, requiring district court judges to make decisions based on technical terminology that has not yet been fully construed.[269] Second, software-related patents are particularly susceptible to pretrial dismissals.[270] Often, the key to the eligibility of a software-related patent lies in its technical aspects.[271]

The Federal Circuit in *McRO, Inc. v. Bandai Namco Games America Inc.*,[272] for example, found that the district court had oversimplified the claim and ignored its technical details when granting the defendant's Rule 12(c) motion.[273] Specifically, the district court failed to consider that the technology "evaluate[d] sub-sequences, generate[d] transition parameters, [and] appl[ied] transition parameters to create a final morph weight set," which constituted specific improvements to computer technology.[274]

In *Visual Memory LLC v. NVIDIA Corp.*,[275] the Federal Circuit similarly determined that the district court's Rule 12(b)(6) dismissal based on ineligibility did not take into account the complexity of the claims.[276] Rather than being directed to the "abstract idea of categorical data storage,"[277] the patent described specific improvements, including content caching and buffering data from different sources, that resulted in a superior memory system.[278] Thus, the two cases above show that a broad characterization of a software claim may obscure the technical functions that make it eligible, which can make appropriate early-stage resolution difficult.[279]

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267. *Id.*

268. *See* Ryan & Frye, *supra* note 11, at 585.

269. *See* Gugliuzza, *supra* note 66, at 588. For further discussion on the issue of district court judges and pre-claim construction decisions, *see infra* Part II.B.5.

270. *See* Stephanie E. O'Byrne & Jeffrey T. Castellano, *On Trend: Rule 12 Dismissals Based on Patent Ineligibility Under § 101*, 23 Fed. Cir. Bar J. 405, 410 (2014); Enfish, LLC v. Microsoft Corp., 56 F. Supp. 3d 1167, 1174 (C.D. Cal. 2014) ("Because software is necessarily intangible, accused infringers can easily mischaracterize and oversimplify software patents."), *aff'd in part, vacated in part, rev'd in part*, 822 F.3d 1327 (Fed. Cir. 2016).

271. *See* O'Byrne & Castellano, *supra* note 270, at 410.

272. 837 F.3d 1299 (Fed. Cir. 2016).

273. *See id.* at 1313.

274. *See id.* at 1314.

275. 867 F.3d 1253 (Fed. Cir. 2017).

276. *See id.* at 1259–60.

277. *Id.* at 1259.

278. *Id.* at 1259–60.

279. *See* O'Byrne & Castellano, *supra* note 270, at 410.

3. Presumption of Validity

The Patent Act provides that all issued patents enjoy the presumption of validity.[280] The Supreme Court has clarified this requirement to mean that a defendant must show the plaintiff's patent is invalid with "clear and convincing evidence."[281] This heightened burden of proof has been routinely applied to novelty, nonobviousness, and definiteness challenges.[282] However, it remains uncertain whether *eligibility* is a form of validity subject to the heightened standard.

If patent eligibility is viewed as a pure question of law, then the heightened burden might not apply.[283] Judge Haldane Robert Mayer definitively stated in a concurring opinion that "no presumption of eligibility attends the section 101 inquiry," as § 101 should be viewed as a "coarse filter."[284] In the years after *Alice*, some courts applied the clear and convincing evidence standard,[285] while others rejected it[286] or searched for a middle ground.[287]

The relationship between § 282 and § 101 shifted when the Federal Circuit issued the *Berkheimer* and *Aatrix* decisions, clarifying that eligibility includes questions of fact and that the heightened evidentiary standard applies to the subsidiary factual inquiries.[288] The *Berkheimer* court specifically held that the question of "whether a claim element or combination of elements is well-understood, routine and conventional . . . must be proven by clear and convincing evidence."[289]

This holding was more recently elaborated on in the Federal Circuit's decision in *Cellspin Soft, Inc. v. Fitbit, Inc.*[290] On appeal from a Rule 12 motion before claim construction, the Federal Circuit emphasized the factual nature of eligibility and the corresponding requirement that a court make

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280. 35 U.S.C. § 282.

281. Microsoft Corp. v. I4I Ltd. P'ship, 564 U.S. 91, 95 (2011).

282. *See* Ted L. Field, *Obviousness as Fact: The Issue of Obviousness in Patent Law Should Be a Question of Fact Reviewed with Appropriate Deference*, 27 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 555, 581 (2017) (noting that a defense of anticipation requires clear and convincing evidence).

283. *See, e.g.*, *Microsoft*, 564 U.S. at 114 (Breyer, J., concurring) (noting that "the evidentiary standard of proof applies to questions of fact and not to questions of law").

284. Ultramercial, Inc. v. Hulu, LLC, 772 F.3d 709, 717, 720 (Fed. Cir. 2014) (Mayer, J., concurring).

285. *See* Trading Techs. Int'l, Inc. v. CQG, Inc., No. 05-CV-4811, 2015 WL 774655, at *3 (N.D. Ill. Feb. 24, 2015), *aff'd*, 675 F. App'x 1001 (Fed. Cir. 2017) ("[T]his Court concludes that, until the Federal Circuit or the United Supreme Court mandates otherwise, [the defendant] must show by clear and convincing evidence that the patents-in-suit claim patent-ineligible subject matter.").

286. *See* OpenTV, Inc. v. Apple, Inc., No. 14-CV-01622, 2015 WL 1535328, at *3 (N.D. Cal. Apr. 6, 2015) (noting that the Federal Circuit has held that the presumption of validity does not apply to § 101).

287. *See* 01 Communique Lab'y, Inc. v. Citrix Sys., Inc., 151 F. Supp. 3d 778, 787 (N.D. Ohio 2015) ("[T]here is uncertainty in the law with respect to the presumption of validity and standard of proof in a § 101 analysis, and district courts across the country have gone both ways.").

288. *See supra* notes 253–57 and accompanying text.

289. Berkheimer v. HP Inc., 881 F.3d 1360, 1368 (Fed. Cir. 2018).

290. 927 F.3d 1306 (Fed. Cir. 2019).

factual inferences in the plaintiff's favor.[291] Further, the court noted that "patents granted by the Patent and Trademark Office are presumptively valid," and that validity includes patent eligibility.[292] However, this assertion was not included in the court's primary eligibility analysis, but rather in the context of deciding whether to vacate the district court's award of attorney's fees.[293] Moreover, the court specified that this decision was made "[i]n the interest of judicial economy," and that it could "remain [an] issue[] on remand."[294]

Although the "clear and convincing evidence" standard has been confirmed as relevant in step two of the *Alice*/*Mayo* inquiry, the application of this standard has been less certain in the years after *Berkheimer*.[295] This implicates a party's burden of proof during Rule 12 motions—specifically, whether a defendant must always challenge eligibility with clear and convincing evidence, or whether they only need to do so if there are factual disputes present.[296]

4. Levels of Generality

Judge Reyna in *Apple, Inc. v. Ameranth, Inc.*[297] stated that "[a]n abstract idea can generally be described at different levels of abstraction."[298] The level of abstraction chosen can influence the ultimate eligibility determination.[299] The level of abstraction issue presents a two-fold conflict: patent applicants have the incentive to draft broad patents to obtain as many rights as possible, but the broader a claim is drafted, the greater the risk of overgeneralization. [300]

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291. *See id.* at 1317, 1318.

292. *Id.* at 1319.

293. *See id.*

294. *Id.*

295. *See* e-Numerate Sols., Inc. v. United States, 149 Fed. Cl. 563, 577 (2020) ("[D]etermining what constitutes factual allegations sufficient to decide patent eligibility as a matter of law has been a matter of great consternation for trial courts."); *see also* Jo Dale Carothers & Weintraub Tobin, *Juries Will Play Role in Some Questions of Patent Eligibility*, JDSUPRA (Sept. 3, 2021), https://www.jdsupra.com/legalnews/juries-will-play-role-in-some-questions-8121755/ [https://perma.cc/8SBC-5ZBJ] (noting that because the number of trials has diminished due to the COVID-19 pandemic, few juries have addressed the issue of eligibility).

296. *See supra* note 260 and accompanying text; *see also* Slyce Acquisition Inc. v. Syte-Visual Conception Ltd., No. 19-CV-00257, 2020 WL 278481, at *5 (W.D. Tex. Jan. 10, 2020) ("[B]ecause a patent is presumed valid and requires clear and convincing evidence to prove its invalidity, a Rule 12(b) motion to dismiss is a procedurally awkward place for a court [to] resolve a patent's § 101 eligibility.").

297. 842 F.3d 1229 (Fed. Cir. 2016).

298. *Id.* at 1240.

299. *See, e.g.*, Enfish, LLC v. Microsoft Corp., 822 F.3d 1327, 1337 (Fed. Cir. 2016) (noting that the district court's characterization of the patent as directed to "the concept of organizing information using tabular formats" was too reductive and recharacterizing it as directed to a "*self-referential* table for a computer database"); *see also* Bui, *supra* note 17, at 234 (describing how the software claims in seven given examples could be overgeneralized and rendered abstract, even though they were ultimately eligible).

300. *See* Kevin Emerson Collins, *Patent Law's Functionality Malfunction and the Problem of Overbroad, Functional Software Patents*, 90 WASH. U. L. REV. 1399, 1411 (2013) (noting

To illustrate the dispositive nature of selecting a level of abstraction, consider the following claims:

1. Power grids are susceptible to failure when various parts of the system are overloaded, but the vast size of electric grids makes monitoring load levels challenging.[301] To solve this problem, data is gathered from strategically chosen grid locations and other sources.[302] The data is analyzed in real time to determine metrics indicating grid stability, and the data is presented in both tabular and visual formats.[303] These metrics are also updated in real time, generating an indicator of grid stability.[304]

2. A security threat occurs when hackers access several computers on the same network, but determining the number of logins on a single computer might not indicate suspicious activity, as the attacks are spread across a vast number of devices.[305] An attempt to solve this problem operates by gathering data from several points within an enterprise network, including metrics that identify suspicious activity.[306] The system turns this data into reports of suspicious activity, which are then received by hierarchical monitoring systems.[307]

These two problems and solutions are facially similar—they both gather data from a wide range of sources, analyze that data, and generate a report regarding the health of the system. However, the first was determined to be directed to an abstract idea, but the second was not. The power grid claim decided in *Electric Power Group, LLC v. Alstom S.A.*[308] was framed by the Federal Circuit as directed to the abstract idea of collecting information, analyzing it, and displaying the results,[309] whereas the network monitoring claim, decided in *SRI International, Inc. v. Cisco Systems, Inc.*,[310] was characterized as directed to "an improvement in computer network technology."[311]

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that inventors draft broader claims to increase the scope of protection and increase financial benefits).

301. U.S. Patent No. 8,401,710 (filed Sept. 29, 2011).

302. *See id.*

303. *See id.*

304. *See id.*

305. U.S. Patent No. 6,711,615 (filed Sept. 25, 2002).

306. An enterprise network is a system that uses hardware and software components to create a connection between an organization's computers, servers, and other devices. *See* BONGSIK SHIN, A PRACTICAL INTRODUCTION TO ENTERPRISE NETWORK AND SECURITY MANAGEMENT 1 (2017).

307. A hierarchical monitoring system uses multiple layers of security detectors to guard an enterprise network. *See* Vinod Nair, Ameya Raul, Shwetabh Khanduja, Vikas Bahirwani, Qihong Shao, Sundararajan Sellamanickam, Sathiya Keerthi, Steve Herbert & Sudheer Dhulipalla, *Learning a Hierarchical Monitoring System for Detecting and Diagnosing Service Issues, in* KDD '15: PROCEEDINGS OF THE 21ST ACM SIGKDD INTERNATIONAL CONFERENCE ON KNOWLEDGE DISCOVERY AND DATA MINING 2029, 2030 (2015).

308. 830 F.3d 1350 (Fed. Cir. 2016).

309. *See id.* at 1354.

310. 930 F.3d 1295 (Fed. Cir. 2019).

311. *See id.* at 1303.

The Federal Circuit held that the claims in *Electric Power* merely used computers as a tool, but that the *SRI* claims improved the functionality of the computer networks themselves.[312]   The opinion in *SRI*, however, did not highlight language within the claim explaining how the data was gathered and analyzed or how it differed from previous holdings that collecting, analyzing, and displaying data is abstract.[313]   Moreover, the court in *Electric Power* did not construe the claims, but the court in *SRI* issued a formal claim construction decision, which may have played a role in the level of generality.[314]

ChargePoint, Inc. v. SemaConnect, Inc.[315] further highlights this tension. Electric vehicle owners, charging station providers, and utility companies are all impacted by the availability of power from electric grids, but they operate in isolation from each other.[316]   By creating an interconnected network of charging points, ChargePoint attempted to resolve these issues by allowing vehicle owners to locate stations and interact intelligently with the grid.[317] ChargePoint brought an infringement action against SemaConnect, who moved to dismiss under Rule 12(b)(6), asserting that ChargePoint's patents were invalid under § 101.[318]   The district court held that claim construction was not necessary to grant SemaConnect's motion to dismiss on the grounds that all claims at issue were directed to patent-ineligible subject matter.[319]

On appeal, the Federal Circuit applied the *Alice*/*Mayo* test.[320]   At step one, the court characterized all eight claims as being directed to the "abstract idea of communicating over a network for device interaction."[321]   The court found that the patent was intended to solve business inefficiencies caused by a lack of interconnected charging points.[322]   However, the Federal Circuit did not consider the patentee's potential intention to improve the efficiency of

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312. *Id.* at 1304.

313. *See, e.g.*, RecogniCorp, LLC v. Nintendo Co., 855 F.3d 1322 (Fed. Cir. 2017) (finding a method of creating a composite image by combining constituent parts as directed to the abstract idea of encoding and decoding data); Data Engine Techs. LLC v. Google LLC, 906 F.3d 999 (Fed. Cir. 2018) (describing the claim as directed to the abstract idea of collecting spreadsheet data, recognizing changes to spreadsheet data, and storing information about the changes); Intell. Ventures I LLC, v. Cap. One Fin. Corp., 850 F.3d 1332 (Fed. Cir. 2017) (describing the claim as directed to the abstract idea of collecting, displaying, and manipulating data).

314. *See* Elec. Power Grp., LLC v. Alstom, S.A., No. CV-1206365, 2015 WL 12720309, at *1 (C.D. Cal. May 21, 2015), *aff'd*, 830 F.3d 1350 (Fed. Cir. 2016) (denying defendant's motion for claim construction); SRI Int'l, Inc. v. Cisco Sys., Inc., 930 F.3d 1295, 1300 (Fed. Cir. 2019) (noting the issue of claim construction on appeal).

315. 920 F.3d 759 (Fed. Cir. 2019).

316. U.S. Patent No. 8,138,715 (filed Mar. 1, 2011).

317. *See id.*

318. ChargePoint, Inc. v. SemaConnect, Inc., No. CV-17-3717, 2018 WL 1471685 (D. Md. Mar. 23, 2018), *aff'd*, 920 F.3d 759 (Fed. Cir. 2019).

319. In making this decision, the court relied only on the contents of the complaint, excluding ChargePoint's submission of expert declarations concerning the nature of the technology, as the declarations were not relied on in their complaint. *See id.* at *4.

320. *See ChargePoint*, 920 F.3d at 768.

321. *Id.* at 773.

322. *See id.* at 768.

electrical grids. The specification[323] of the '715 patent notes that "[e]lectric vehicles can be . . . a source of electric power to be transferred to the local electricity grid," which can help the grid "meet the demand for electricity when demand is at its highest."[324] This suggests that the patent may have been intended to address technical problems related to the efficiency of electric grids, rather than simply to address business inefficiencies.

The decisions in *Electric Power*, *SRI*, and *ChargePoint* highlight the tension between the desire for broad patent protection and the requirement that patents be directed to nonabstract, specific applications or implementations of ideas.

5. District Court Expertise and Early-Stage Eligibility

The *Alice*/*Mayo* test and related inquiries are fact intensive, often requiring a detailed analysis of the technical aspects of the claims.[325] As district courts are the initial forum for validity disputes, a district court judge faced with a Rule 12 dismissal for ineligible subject matter must apply the *Alice*/*Mayo* test based on the pleadings alone.[326] However, district court judges may have limited technical knowledge[327] and may need to break the claims down into more manageable parts to apply the test, which risks over-abstracting the claims.[328]

Performing the eligibility analysis before claim construction or before considering extrinsic evidentiary resources may require the analysis of technical concepts that some district courts are unequipped to handle.[329] This can lead to inaccurate analysis of the claims at issue and make early-stage eligibility analysis inaccurate at the district court level, particularly before claim construction.[330]

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323. Although Federal Circuit opinions are inconsistent about whether the specifications may be considered in a § 101 analysis, the *ChargePoint* court noted that "the specification may . . . be useful in illuminating whether the claims are 'directed to' the identified abstract idea." *Id.* at 767. (quoting Ariosa Diagnostics, Inc. v. Sequenom, Inc., 788 F.3d 1371, 1376 (Fed. Cir. 2015)).

324. U.S. Patent No. 8,138,715 (filed Mar. 1, 2011).

325. *See supra* Part II.B.2.

326. *See* 28 U.S.C. § 1400(b).

327. *See* Kumar, *supra* note 60, at 886–87 (noting that district court judges tend to not have technical expertise). Judges sometimes rely on technical experts to understand the relevant technology, but party-hired and court-appointed experts pose evidentiary and logistical issues. *See generally id.*

328. *See, e.g.*, Enfish, LLC v. Microsoft Corp., 822 F.3d 1327, 1337 (Fed. Cir. 2016) (noting that the district court described the claims "at a high level of abstraction and untethered from" the claim's language).

329. *See, e.g.*, Mayo Collaborative Servs. v. Prometheus Lab'ys, Inc., 566 U.S. 66, 89 (2012) ("Courts and judges are not institutionally well suited to making the kinds of judgments needed to distinguish among different laws of nature.").

330. *See, e.g.*, Michael R. Woodward, *Amending* Alice: *Eliminating the Undue Burden of "Significantly More,"* 81 ALB. L. REV. 329, 356 (2018) (noting that district courts tend to break down claims into their fundamental elements, which are often directed at abstract ideas, placing an undue burden on the litigant to show novelty and nonobviousness at the § 101 stage).

Despite providing a flexible approach to patent eligibility, the *Alice*/*Mayo* test has proved challenging when applied during a Rule 12 motion due to disputes over legal and factual questions, the evidentiary burdens, overgeneralization, and premature decisions about technically complex claims. Part III discusses an approach to mitigate these challenges.

III. RESOLVING PLEADING-STAGE UNCERTAINTY UNDER THE *ALICE/MAYO* TEST

The *Alice/Mayo* test, although offering a flexible approach to patent eligibility, can be difficult to apply in the early stages of litigation. First, the limited record combined with the factual nature of the *Alice*/*Mayo* test makes it difficult to determine eligibility based on the pleadings alone.[331] Second, the presumption of validity conflicts with the evidentiary standards for early-stage decisions.[332] Third, software claims are prone to oversimplification and therefore vulnerable to abstraction, particularly before claim construction.[333] Finally, eligibility can be a technically complex inquiry, which district courts may not be equipped to evaluate before claim construction.[334]

Given these challenges, courts should approach Rule 12 eligibility determinations with caution. This section argues that incorporating claim construction into the pleadings will resolve the factual, analytical, and procedural issues described above. Part III.A proposes adopting claim construction into the pleadings stage as a way to manage the technically complex aspects of eligibility and signal the presence of factual disputes. Part III.A then discusses how the proposed approach resolves the challenges associated with Rule 12 eligibility determinations. Part III.B discusses how a pleading-form of claim construction can help strike a balance between the merits of early resolution and the need for thorough consideration.

A. Claim Construction as Vehicle for Rule 12 Eligibility Disputes

Claim construction can help determine patent eligibility, as it allows parties to advocate for their interpretation of the claim and establish a full understanding of the claimed subject matter.[335] However, mandating formal claim construction in *every* dispute would conflict with the procedural posture of the *Alice* decision;[336] would preclude the possibility of deciding eligibility on a motion to dismiss; and may not be necessary in cases where the claims, specification, and prosecution history clearly establish eligibility. Instead of imposing a blanket rule requiring claim construction in all

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331. *See supra* notes 271–79.
332. *See supra* Part II.B.3.
333. *See* Garza, *supra* note 71, at 60–61.
334. *See supra* notes 327–30 and accompanying text.
335. Specifically, overabstraction may lead to confusion at the district court level. *See, e.g.*, Enfish, LLC v. Microsoft Corp., 822 F.3d 1327, 1337 (Fed. Cir. 2016); Mayo Collaborative Servs. v. Prometheus Lab'ys, Inc., 566 U.S. 66, 89 (2012); Woodward, *supra* note 330 at 356.
336. Although *Alice* was decided at summary judgment, the parties had not undergone formal claim construction. *See supra* note 167.

eligibility cases, the principles of claim construction can be incorporated into the pleadings stage as a way to prevent oversimplification of the disputed claim and signal when a factual dispute is present.[337]

Thus, this Note's proposed approach works as follows: a defendant raising a Rule 12 motion alleging that the plaintiff's patent is ineligible must show that nothing in the intrinsic record—i.e., the claims, specification, and prosecution history—can plausibly support a claim construction that would indicate that the claim is not directed to an abstract idea or that it includes an inventive concept. If the plaintiff asserts that the intrinsic record supports a plausible interpretation of the claim that demonstrates its eligibility, such as its technical solution to a problem or its improvement of technology,[338] the case should proceed to discovery. Similarly, if the court determines that there is a genuine dispute over the interpretation of the claim, the case should also proceed to discovery. If the pleaded facts are insufficient and extrinsic evidence (like expert testimony or technical publications) is needed to fully comprehend the claims, the court should delay the eligibility determination until the claims are properly construed.

By focusing on whether the pleaded facts and intrinsic record support the plaintiff's *construction* of the claim, rather than whether the complaint plausibly supports eligibility on its own, this approach addresses (1) the law/fact divide,[339] (2) the presumption of validity and evidentiary burdens,[340] (3) the overgeneralization issue,[341] and (4) the challenge district courts face in analyzing complex technology.[342]

1. The Law/Fact Divide and Evidentiary Burdens

Eligibility, which is ultimately a question of law, can involve factual considerations[343] that may arise at either step, albeit more frequently at step two.[344] If the defendant successfully argues that the claims, specification, and prosecution history cannot plausibly support eligibility, the inquiry remains a pure question of law.[345] However, if the litigants dispute the construction of a term in the intrinsic record that can be clarified by extrinsic evidence, or if extrinsic evidence is required to understand the technical

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337. *See generally* Gugliuzza, *supra* note 66, at 624–29 (discussing the merits of determining eligibility after claim construction). For instance, if the litigants have a disagreement over the meaning of a term and the plaintiff's interpretation would suggest eligibility, there is a genuine factual dispute.

338. *See* discussion *supra* Parts II.A.1–3 (discussing the "shadow tests" for eligibility).

339. *See infra* Part III.A.1.

340. *See infra* Part III.A.1.

341. *See supra* Part II.A.2.

342. *See supra* Part II.A.2.

343. *See supra* Part II.B.1.

344. The *Alice* Court used history and economics textbooks to determine that the claim pertained to a fundamental economic concept, and the *Enfish* district court consulted history books to reach a similar conclusion. *See* Alice Corp. v. CLS Bank Int'l, 573 U.S. 208, 219–20 (2014); Enfish, LLC v. Microsoft Corp., 56 F. Supp. 3d 1167, 1176 (C.D. Cal. 2014). *See also* Berkheimer v. HP Inc. 881 F.3d 1360, 1368 (Fed. Cir. 2018).

345. *See* Teva Pharms. USA, Inc. v. Sandoz, Inc., 574 U.S. 318, 331 (2015) (noting that a decision made on the intrinsic record alone will only involve issues of law).

aspects of the claimed invention, then factual questions arise and dismissal should be precluded.[346] Thus, the factual questions are not analyzed at the pleadings stage—rather, they are uncovered through the pleading form of claim construction.

Further, using claim construction to address eligibility on a Rule 12 motion does not exceed the scope of materials that a court may consider during a pleading-stage motion. These materials—namely the complaint, patent claims and specification, and prosecution history—are all acceptable considerations at this stage.[347] Additionally, staying within the bounds of the intrinsic record avoids the issues of presumption of validity and the need for "clear and convincing evidence," as the determination remains a question of law.[348]

2. Levels of Generality and Technical Complexities

The more broadly a claim is interpreted, the more likely it is to fail under § 101.[349] Moreover, when a defendant challenges eligibility, they will typically argue for the broadest and most abstract interpretation, while the plaintiff will advocate for a narrower construction.[350] This implicates two related problems: software's vulnerability to oversimplification as well as susceptibility to abstraction,[351] and eligibility's connection to technical complexities that district courts may not be equipped to handle at the pleading stage.[352]

Therefore, rather than requiring district courts to evaluate the technology itself, dismissal should be avoided if the plaintiff's pleaded facts *plausibly*, but not necessarily precisely, support the narrower construction.[353] By emphasizing construction rather than a direct interpretation of the claims, a description of the technology can be effectively conveyed to a person skilled in the art but phrased in a manner that is easily understandable to those who are not familiar with the relevant field.[354] With this approach, the court does not need to choose between the two constructions, preventing the premature analysis of highly technical concepts.

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346. *See* Menell et al., *supra* note 56, at 725.

347. *See* Data Engine Techs. LLC v. Google LLC, 906 F.3d 999, 1008 n.2 (Fed. Cir. 2018) (noting that prosecution records are matters of the public record that can be considered at the pleadings stage).

348. *See supra* note 283 and accompanying text; *Teva Pharms.*, 574 U.S. at 331 (noting that a decision made on the intrinsic record alone will only involve issues of law).

349. *See* discussion *supra* part II.B.4.

350. *See* Garza, *supra* note 71, at 45, 61.

351. *See* discussion *supra* part II.B.4.

352. *See* discussion *supra* part II.B.5.

353. The focus on plausibility fits with the standards for dismissal, as the court focuses on whether the legal theory is plausible, rather than the merits of the plaintiff's pleaded facts. *See* FED. R. CIV. P. 12(b)(6); Ashcroft v. Iqbal, 556 U.S. 662, 678 (2009).

354. *See supra* Part I.A.3; *see also* Hoechst Celanese Corp. v. BP Chems. Ltd., 78 F.3d 1575, 1578 (Fed. Cir. 1996).

B. Scylla and Charybdis: Balancing Resource Conservation and Fair Litigation

Justice Breyer's assertion that expanding or restricting patent eligibility is a task of choosing "between Scylla and Charybdis" rings true in deciding whether to allow pretrial dismissals.[355] Determining patent eligibility under the *Alice/Mayo* test can be particularly challenging, given the uncertainty surrounding the application of the abstract-ideas doctrine and the complex and nuanced nature of the analysis required.[356] This difficulty, which can arise even after full discovery and claim construction, is compounded in the context of a Rule 12 motion.

To strike a balance between conserving resources and thoroughly examining the issues, incorporating claim construction into the pleadings will indicate when eligibility can be clearly determined from the intrinsic record, or whether further discovery and formal construction is necessary. Plaintiffs will have the opportunity to explain the intent behind their claims and why the technically complex elements support eligibility.[357] This is particularly beneficial for software patent holders, as software claims are vulnerable to overgeneralization and abstraction.[358] Defendants will still be able to bring pleading-stage eligibility defenses, allowing for early resolution if the plaintiff's claim has no plausible support for eligibility in the intrinsic record,[359] which is useful in cases where the plaintiff is a patent troll or the patent at issue is weak and overbroad.[360] By allowing for an early resolution of these specific cases, parties can save time and resources that would otherwise be spent on unnecessary discovery and litigation.[361]

Overall, a pleading form of claim construction can provide a more efficient and effective means of determining patent eligibility under the *Alice/Mayo* test.

CONCLUSION

The legal system's approach to patent eligibility can be at odds with software patent validity, as software is often inherently abstract. This difficulty is further exacerbated when determining eligibility under Rule 12, as an eligibility determination requires a thorough analysis of the technology at hand.

To address this challenge, incorporating claim construction into the pleadings stage may offer a useful solution, enabling litigants to provide a more complete understanding of the technical and factual aspects of the

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355. Transcript of Oral Argument at 17, Alice Corp. v. CLS Bank Int'l, 573 U.S. 208 (2014) (No. 13-298).

356. *See* discussion *supra* Part II.A.

357. *See supra* notes 353–54 and accompanying text.

358. *See* Garza, *supra* note 71, at 45.

359. *See supra* notes 347–48 and accompanying text.

360. *See, e.g.*, Skelps, *supra* note 1.

361. *See* Ultramercial, Inc. v. Hulu, LLC, 772 F.3d 709, 718–19 (Fed. Cir. 2014) (Mayer, J. concurring).

claimed invention. This approach can aid in the determination of eligibility, signal when dismissal is premature, and provide a more efficient and effective means of resolving cases, particularly those involving patent trolls or weak and overbroad patents. Thus, claim construction can be a valuable tool for improving the predictability, reliability, and consistency of the eligibility determination process under Rule 12.