

Professional Perspective

AI & Patent Proceedings

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AI & Patent Proceedings

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Artificial intelligence technologies have become so pervasive that consumers no longer pause to consider their widespread adoption. A [Bloomberg Law article](#) noted that U.S. patent applications mimicked the larger investment in AI technologies. Usually, consumer adoption of a given technology correlates to the level of IP litigation. Unlike other technological changes over the past couple decades, AI-related IP disputes have lagged behind consumer adoption.

Contemporaneously, the Patent Trial and Appeals Board (PTAB) emerged as a popular forum to address invalidity concerns. The PTAB remains among the busiest patent forums in U.S. patent litigation. Despite the flurry of the activity, very few PTAB disputes are directly tied to AI technologies.

This article explores the growth of AI technologies and the reasons for the limited footprint of AI disputes before the PTAB, which provides early lessons that can be used to extrapolate future trends.

Growth of AI

Academic interest in AI goes back to discussion of artificial neurons during World War II. For the longest time, AI remained only the subject of academia and government grants. Early commercialization efforts were flops—such as the attempt to build a LISP machine designed to implement AI languages. Even where traditional software development companies invested in AI capability, developing AI capability was often characterized by proprietary solutions, increased development costs, and increased risks. Instances of early success were difficult to maintain and grow.

Despite these difficulties, a more robust AI infrastructure emerged in the 2010s. Large developers began releasing tools and infrastructure for third-party customers. These tools included Amazon's AWS, Microsoft's Azure, and open-source tools like TensorFlow—greatly reducing the barrier to entry for AI products. These projects were designed for cloud-based infrastructure that could be leased and rapidly scaled from a prototype into a commercial offering. Small ventures could now introduce best-in-class solutions with minimal delay.

The adoption of AI technologies is best reflected in market size estimates. In 2016, the size of the AI market was [estimated](#) at \$8 billion. In 2021, the market's [estimated size](#) grew to \$35.92 billion, and was predicted to increase to a \$360.62 billion market in 2028. Growth of AI technologies is not limited to server infrastructure but is firmly entrenched in consumer-facing technologies. These technologies include virtual assistants in smart appliances and wireless phones, robotic vacuum cleaners, facial recognition systems, and autonomous vehicles.

Cloud Over Software Innovation

The rapid growth of AI technologies took place at a time when the patentability of software innovation underwent a significant transformation. Concerns over patent assertion entities, that primarily asserted software patents, contributed to the enactment of the America Invents Act on Sept. 16, 2011. The AIA allows defendants to confidently bring invalidity challenges before seasoned panels of Administrative Patent Judges. Those disputes are then adjudicated within 18 months.

The patent bar quickly developed confidence in these proceedings and within a short period of time, the PTAB became one of the busiest forums for patent disputes. The AIA featured provisions for review of Covered Business Method patents, allowing the PTAB to review patents directed to financial services. As of September 16, 2020, Covered Business Method proceedings are no longer available.

Alice Decision

The Supreme Court took up subject matter eligibility related to software innovation in *Alice Corp. v. CLS Bank International*. *Alice Corp. v. CLS Bank Int'l*, [573 U.S. 208](#) (2014). Concerned that applicants were merely computerizing age-old economic concepts, the court imposed a two-part test to decide whether a given claim was abstract, and thus, ineligible under [35 U.S.C. § 101](#):

- **Step One.** A court should determine whether a patent claim contains an abstract idea, such as an algorithm, method of computation, or other general principle.

- **Step Two.** If the claim does not contain an abstract idea, the claim contains eligible subject matter.
- Even if the claim contains an abstract idea, a court should determine whether the remainder of the claim contains an inventive concept—something significantly more that justifies patent protection.

Subsequent cases have found that internetizing well-known concepts does not warrant eligible subject matter.

Impacts of Alice

Not unlike a meteor impact, the *Alice* decision generated a winter that cast a pall over software-related patents and applications for several years. In the two years between *Alice* and *Enfish, LLC v. Microsoft Corp.*, very few software-related cases were affirmed. *Enfish LLC v. Microsoft Corp.*, [822 F.3d 1327](#) (Fed. Cir. 2016).

The combined impact of the AIA and *Alice* on the broader market for software-related IP cannot be overstated. For some examining art units at the U.S. Patent and Trademark Office, the number of Office Actions featuring rejection under [35 U.S.C. § 101](#) grew from 33% to more than 90%. Allowance rates for these same art units went from about 25% to around 5%.

The impact of *Alice* was more significant for the financial services sector, where the AIA featured provisions for review of Covered Business Method patents. This allowed the PTAB to review patents directed to financial services for additional reasons, including an *Alice*-style review.

AI Growth Amid Uncertainty Over the Underlying IP

The IP market for AI technologies seemingly embodied an inconsistent dichotomy. Despite the AI market growth and AI-related patent filings, patent owners were reluctant to bring litigation over AI technologies.

A survey of recent PTAB cases from the past five years reveals that very few AI disputes were brought before the PTAB. See, e.g., *Cisco Systems, Inc. v. Centripetal Networks, Inc.*, No. 2018-01386 (P.T.A.B. Jan. 23, 2020); *Fitbit, Inc. v. Valencell, Inc.*, No. 2017-00319 (P.T.A.B. Apr. 5, 2021); *Apple, Inc. v. Core Wireless Licensing S.A.R.L.*, No. 2015-01902 (P.T.A.B. Jan. 27, 2017); *Microsoft Corp. v. FG SRC LLC*, No. 2018-01601 (P.T.A.B. Apr. 9, 2020); *Comcast Cable Commc'n, LLC v. Rovi Guides, Inc.*, No. 2019-00555 (P.T.A.B. July 21, 2020).

Depending on the search criteria employed, investigations reveal only a handful of final written decisions involving intelligence-related terms that appeared in the claims, decisions, or specifications. Many of these cases remain on appeal but it is useful to consider these early decisions as portending future trends.

Projected Difficulties

Lay audiences might expect to encounter certain difficulties in prosecuting AI disputes before the PTAB. The following questions remain in AI patent litigation:

- Whether the technical complexity of AI patents poses challenges like those presented by pharmaceutical cases, where the technical complexity could favor patent owners.
- Whether the dearth of commercial literature will increase petitioner reliance on non-patent literature, especially academic journals. However, increased use of academic literature may pose other difficulties because it often features narratives in which discussion of the underlying structure is limited.
- Whether enough subject matter experts exist, given that commercialization did not take place until the 2010s.

Overview of Outcomes

While only a small subset of cases directly implicate AI technologies, these early data points suggest that AI disputes before the PTAB will maintain much of the character of existing software and telecommunications disputes. While most AI-related *inter partes* review (IPR) proceedings feature consumer-facing technologies, very few disputes center on cloud-based functionality.

In litigated cases, the number of claim elements directed to AI-specific aspects was usually limited. If a claim featured four elements, only one element focused on AI functionality or the AI functionality may have been pushed to a dependent claim.

While AI cases remain technically difficult, petitioners prevailed in AI-related disputes at least at the same rates as petitioners involved in comparable telecom and other types of software IPRs.

Similarities & Differences of AI IPR Disputes

Patent Specification

Software IPRs often involve disputes over means plus functionality. The requirement to demonstrate how prior art provides the corresponding structure under [35 U.S.C. § 112\(f\)](#) requires petitioners map select portions of a patent specification with corresponding narrative in the prior art. This often involves demonstrating how a particular algorithm from the specification provides the detail required by the claim. These early AI IPRs revealed no greater incidence of [35 U.S.C. § 112\(f\)](#) efforts beyond those required in other software-related IPRs.

COTS-Based AI Disputes

Many of the IPR disputes early in the AIA involved e-commerce initiatives from traditional retailers. Licensing campaigns often focused solely on the use of an e-commerce portal. Many of the accused infringers were reliant on third-party developers and commercial-off-the-shelf (COTS) solutions to bring about functionality. Mere use of these COTS solutions formed the basis of the allegations.

Unlike the earlier e-commerce disputes, the adoption of COTS-based AI products has not triggered AI-based disputes before the PTAB. This may be because many of the AI-based solutions are resident in the cloud and are not rebranded for third parties. For whatever reason, this form of dispute has not yet emerged.

PTAB AI Disputes Generally

Other AI dispute results generally conform with expected PTAB practices. There does not appear to be an inordinate number of claim construction disputes. Reliance upon academic literature did not trigger broader concerns over enablement of prior art. Expert qualification and the ability to speak to the mindset of a person of ordinary skill in the art as of the time of filing did not appear to cause concerns.

Defense Claims

Attacks on obviousness and motivation to combine remain a key strategy for patent owners. The prominent role of academic literature can affect obviousness arguments in two ways. The lack of structure in academic literature may lead patent owners to argue the prior art lacks the structure or sequence required by the claims. Yet that same lack of structure in academic literature often allows petitioners to integrate the general functionality into obvious combinations without any of the structure that teaches away in other literature.

Like most IPRs, patent owners continue to try and import limitations from the specification into the claims. To date, those arguments have generally not prevailed. Nor have patent owners amended claims to import the desired functionality.

Future of AI-Related Post-Grant Disputes

The PTAB will likely continue to see more reliance on non-patent literature in AI IPRs. Commercialization in AI disciplines only took place on a widespread basis in the 2010s but very little of this literature is routinely considered by the PTAB in post-grant disputes.

New Technologies

IP disputes involving AI technologies likely will move beyond consumer-facing technologies. The next generation of wireless technologies (6G) will incorporate AI components. Among other improvements, 6G technologies will dynamically push increased processing capability to the edge. Likely to be adopted pursuant to standards-setting processes, new waves of standards-essential patents will impact the adoption of these standards. Patent owners may assert patents against wireless entities based solely on their use of 6G wireless networks and handsets. These standards will trigger allegations of infringement by cloud-based AI analytics where limited visibility previously existed.

Role of Experts

Expectations of experts also likely will increase. To date, many experts in AI disputes have come from general computer science backgrounds, which is appropriate. Indeed, until recently, AI was typically taught as an advanced elective within a computer science curriculum. Far larger curriculums now exist and some universities have even set up data science majors with broad exposure to AI disciplines. While computer science is obviously a strong foundation, the parties to future disputes will benefit from experts with hands-on expertise in AI tools. However, the pool of desired experts will be smaller than the computer science faculty previously relied upon.

Software Developers

Finally, the role of non-traditional software developers will increase. I recently conducted an interview with a small software developer, and over the past year, the developer replaced their AI infrastructure several times. The technology lead made decisions to change the underlying AI engine after confirming that new engines would improve model accuracy. After several such replacements, the technical lead was not shy about referring to the solution as AI-agnostic. For them, AI had reached commoditized levels where the benefits surpassed any disruptions.

Even the smallest development operations can readily adopt AI solutions with minimal impact to ongoing operations. This elimination of the barrier to entry likely means that many more companies will be able to practice the AI technologies at issue in AI-related patents.

Conclusion

As AI solutions become even more pervasive, companies will be confronted with even more IP assertions. The lack of assertions against AI-based solutions to date reflects on the nascent nature of the industry when *Alice* jurisprudence raised larger questions about software eligibility in general.

Even as developers can expect to face more assertions involving AI-based patents, the community can be confident that invalidity challenges before the PTAB will likely conform to prior outcomes before the Board. There may be continued shifts in the nature of the prior art and the desire for different classes of experts. However, the overall character should be consistent with that seen since the inception of the AIA.